

# NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

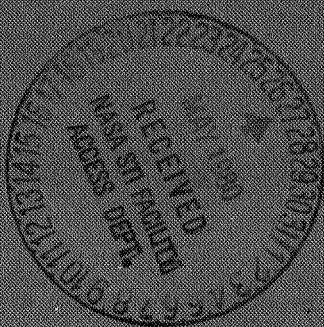
(NASA-TM-80989) INDEX OF NACA TECHNICAL  
PUBLICATIONS, JUNE, 1951 - MAY, 1953  
(National Advisory Committee for  
Aeronautics) 237 p

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## INDEX OF NACA TECHNICAL PUBLICATIONS

June, 1951 - May, 1953



WASHINGTON - 1953

## P R E F A C E

The Preface to the Index of NACA Technical Publications, 1915-1949, mentioned that regular supplements would be issued in the future. This is the second such Supplement and covers those documents issued through May of 1953. Similar arrangement is used in both Indexes. First, there is a classified listing of the subject categories; second, a chronological listing of NACA publications under each subject category; third, an alphabetical index to the subject categories; and finally, an author index. Immediately following this Preface is an Explanatory Chart of NACA Publications Series Designations which may be of use in identifying references to NACA documents encountered in the literature.

For those maintaining a file of NACA index cards, it is recommended that cards issued for reports dated prior to June 1, 1953, be removed from the file as this volume includes the same index information.

NACA documents issued since June 1, 1953, have been listed in NACA Research Abstracts, an announcement service which also includes notices of declassification of NACA documents and listings of unpublished NACA documents available on loan.

Division of Research Information  
National Advisory Committee for Aeronautics  
1724 F Street, N. W.  
Washington 25, D. C.

Dec. 15, 1953



EXPLANATORY CHART OF NACA PUBLICATIONS SERIES  
DESIGNATIONS

PUBLICATIONS SERIES	SYMBOL	CURRENTLY ISSUED	NUMBERED CONSECUTIVELY	NUMBER BASED ON LABORATORY** OF ORIGIN	NUMBER BASED ON DATE OF ISSUE- YEAR* MONTH# DAY##	EXAMPLE WITH EXPLANATION
Reports	None	Yes	Yes	No	No	Report 1004 - 1004th Report issued.
Research Memorandums	RM	Yes	No	Yes	Yes	RM L9K03a - Research Memorandum written by Langley Laboratory Personnel in 1949 and issued on November 3rd, being the second RM released on that date.
Technical Memorandums	TM	Yes	Yes	No	No	TM 1313 - 1313th Technical Memorandum issued.
Technical Notes	TN	Yes	Yes	No	No	TN 2432 - 2432nd Technical Note issued.
War-time Reports	WR	No	Yes	Yes	No	WR A-6 - 6th War-time Report issued that was based on Ames Laboratory research. Reported earlier to a limited audience and was reprinted.
Adv. Conf. Reports	ACR	No	No	Yes, after March, 1944##	Yes, after April, 1943##	ACR E4D19 - Advance Confidential Report written by Lewis Laboratory personnel in 1944 and issued on April 19th.
Adv. Rest'd. Reports	ARR	No	No	Yes, after March, 1944##	Yes, after April, 1943##	ARR L4K22b - Advance Restricted Report written by Langley Laboratory personnel in 1944 and issued on November 22nd, being the 3rd ARR issued on that date.
Conf. Bulletins	CB	No	No	Yes, after March, 1944##	Yes, after April, 1943##	CB E5J11 - Confidential Bulletin written by Lewis Laboratory personnel in 1945 and issued October 11th.
Memorandum Reports	MR	No	No	Yes, after October, 1944##	Yes, after October, 1944##	MR A4L12 - Memorandum Report written by Ames Laboratory personnel in 1944 and issued on December 12th.
Restricted Bulletins	RB	No	No	Yes, after March, 1944##	Yes, after April, 1943##	RB E6D22 - Restricted Bulletin written by Lewis Laboratory personnel in 1946 and issued on April 22nd.
Aircraft Circulars	AC	No	Yes	No	No	AC 150 - 150th Aircraft Circular issued.

## Symbol and date only used prior to date mentioned.

**A - Ames	*5 - 1945	50 - 1950	#A - January	G - July	## 01
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L - Langley	7 - 1947	52 - 1952	C - March	I - September	03 . . etc. to 31 followed by
	8 - 1948		D - April	J - October	a - 2nd document issued that date
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# **AERODYNAMICS**

**(1)**

## Fundamental

### (1.1)

ESTIMATION OF THE FORCES AND MOMENTS ACTING ON INCLINED BODIES OF REVOLUTION OF HIGH FINENESS RATIO. H. Julian Allen. November 14, 1949. 27p. diags. (NACA RM A9126) (Declassified from Restricted, 6/11/53)

A STUDY OF EFFECTS OF VISCOSITY ON FLOW OVER SLENDER INCLINED BODIES OF REVOLUTION. H. Julian Allen and Edward W. Perkins. 1951. ii, 13p. diags., photos. (NACA Rept. 1048. Formerly TN 2044)

THE SIMILARITY LAW FOR HYPERSONIC FLOW ABOUT SLENDER THREE-DIMENSIONAL SHAPES. Frank M. Hamaker, Stanford E. Neice and A. J. Eggers, Jr. August 1951. 22p. diags. (NACA TN 2443)

EXPRESSIONS FOR MEASURING THE ACCURACY OF APPROXIMATE SOLUTIONS TO COMPRESSIBLE FLOW THROUGH CASCADES OF BLADES WITH EXAMPLES OF USE. John T. Sinnette, Jr., George R. Costello and Robert L. Cummings. October 1951. 33p. diags. (NACA TN 2501)

EXPERIMENTAL AERODYNAMIC DERIVATIVES OF A SINUSOIDALLY OSCILLATING AIRFOIL IN TWO-DIMENSIONAL FLOW. Robert L. Halfman, Massachusetts Institute of Technology. November 1951. 83p. diags., photo., 19 tabs. (NACA TN 2465)

ON THE SPECTRUM OF ISOTROPIC TURBULENCE. H. W. Liepmann, J. Laufer and Kate Liepmann, California Institute of Technology. November 1951. 61p. diags. (NACA TN 2473)

EVALUATION OF HIGH-ANGLE-OF-ATTACK AERODYNAMIC-DERIVATIVE DATA AND STALL-FLUTTER PREDICTION TECHNIQUES. Robert L. Halfman, H. C. Johnson and S. M. Haley, Massachusetts Institute of Technology. November 1951. 154p. diags., photos., 11 tabs. (NACA TN 2533)

HEAT CAPACITY LAG IN GASES. Richard Walker, Iowa State College. November 1951. 40p. diags., tab. (NACA TN 2537)

A STUDY OF SECOND-ORDER SUPERSONIC FLOW THEORY. Milton D. Van Dyke. 1952. ii, 23p. diags. (NACA Rept. 1081. Formerly TN 2200)

A SOLUTION OF THE NAVIER-STOKES EQUATION FOR SOURCE AND SINK FLOWS OF A VISCOUS HEAT-CONDUCTING COMPRESSIBLE FLUID. Robert V. Hess. February 1952. 60p. diags., tab. (NACA TN 2630)

SOME EXPERIMENTS ON VISUALIZATION OF FLOW FIELDS BEHIND LOW-ASPECT-RATIO WINGS BY MEANS OF A TUFT GRID. John D. Bird and Donald R. Riley. May 1952. 32p. photos., diags., tab. (NACA TN 2674)

A VECTOR STUDY OF LINEARIZED SUPERSONIC FLOW APPLICATIONS TO NONPLANAR PROBLEMS. John C. Martin. June 1952. 81p. diags., tab. (NACA TN 2641)

A STUDY OF THE TRANSIENT BEHAVIOR OF SHOCK WAVES IN TRANSONIC CHANNEL FLOWS. Robert V. Hess. October 1952. 32p. diags. (NACA TN 2797)

ON THE CALCULATION OF FLOW ABOUT OBJECTS TRAVELING AT HIGH SUPERSONIC SPEEDS. A. J. Eggers, Jr. October 1952. 25p. diags. (NACA TN 2811)

## INCOMPRESSIBLE FLOW

### (1.1.1)

STUDY OF EFFECTS OF SWEEP ON THE FLUTTER OF CANTILEVER WINGS. J. G. Barmby, H. J. Cunningham and I. E. Garrick. 1951. ii, 25p. diags., photo., 7 tabs. (NACA Rept. 1014. Formerly TN 2121; RM L8H30)

INVESTIGATION OF SEPARATION OF THE TURBULENT BOUNDARY LAYER. G. B. Schubauer and P. S. Klebanoff, National Bureau of Standards. 1951. 20p. diags., photos., 8 tabs. (NACA Rept. 1030. Formerly TN 2133)

FLOW THROUGH CASCADES IN TANDEM. William E. Spraglin. June 1951. 44p. diags. (NACA TN 2393)

APPROXIMATE METHOD OF INTEGRATION OF LAMINAR BOUNDARY LAYER IN INCOMPRESSIBLE FLUID. (Priblizhennyi Metod Integrirovania Uravnenii Laminarnogo Pogranichnogo Sloia v Neszhimaemom Gaze). L. G. Loitsianskii. July 1951. 21p. diags. (NACA TM 1293. Trans. from Prikladnaya Matematika i Mekhanika, v.13, no.5, Oct. 1949, p.513-525).

ANALYSIS OF PURE-BENDING FLUTTER OF A CANTILEVER SWEPT WING AND ITS RELATION TO BENDING-TORSION FLUTTER. H. J. Cunningham. September 1951. 24p. diags. (NACA TN 2461)

A PROCEDURE FOR CALCULATING THE DEVELOPMENT OF TURBULENT BOUNDARY LAYERS UNDER THE INFLUENCE OF ADVERSE PRESSURE GRADIENTS. Kennedy F. Rubert and Jerome Persh. September 1951. 61p. diags. (NACA TN 2478)

*Incompressible Flow (Cont.)*

RESISTANCE OF CASCADE OF AIRFOILS IN GAS STREAM AT SUBSONIC VELOCITY. (Soprotivlenie Reshetki Profilei v Gazovom Potoke s Dokriticheskimi Skorostiami). L. G. Loitsianskii. September 1951. 30p. diags. (NACA TM 1303. Trans. from Prikladnaya Matematika i Mekhanika, v.13, no.2, 1949).

GENERALIZATION OF JOUKOWSKI FORMULA TO AN AIRFOIL OF A CASCADE IN COMPRESSIBLE GAS STREAM WITH SUBSONIC VELOCITIES. (Obobshchenie Formuly Zhukovskogo na Sluchai Profilia v Reshetke Obtekaemoi Szhimaemym Gazom pri Dozvukovykh Skorostiakh). L. G. Loitsianskii. September 1951. 16p. diags. (NACA TM 1304. Trans. from Prikladnaya Matematika i Mekhanika, v.13, no.2, 1949, p.209-216).

MATHEMATICAL IMPROVEMENT OF METHOD FOR COMPUTING POISSON INTEGRALS INVOLVED IN DETERMINATION OF VELOCITY DISTRIBUTION ON AIRFOILS. I. Flügge-Lotz, Stanford University. October 1951. 84p. diags., 3 tabs. (NACA TN 2451)

STUDIES OF VON KÁRMÁN'S SIMILARITY THEORY AND ITS EXTENSION TO COMPRESSIBLE FLOWS. A CRITICAL EXAMINATION OF SIMILARITY THEORY FOR INCOMPRESSIBLE FLOWS. C. C. Lin and S. F. Shen, Massachusetts Institute of Technology. November 1951. 24p. (NACA TN 2541)

CONCERNING THE FLOW ABOUT RING-SHAPED COWLINGS. PART II - ANNULAR BODIES OF INFINITE LENGTH WITH CIRCULATION FOR SMOOTH ENTRANCE. (Über die Strömung an ringförmigen Verkleidungen. II. Mitteilung: Ringkörper unendlicher Tiefe mit Zirkulation bei stossfreiem Eintritt). Dietrich Küchemann and Johanna Weber. November 1951. 41p. diags. (NACA TM 1326. Trans. from Zentrale für wissenschaftliches Berichtswesen über Luftfahrtforschung, Berlin. FB 1236/2, November 11, 1940).

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DIRECT MEASUREMENTS OF SKIN FRICTION. Satish Dhawan, California Institute of Technology. January 1952. 60p. diags., photos. (NACA TN 2567)

DESIGN OF TWO-DIMENSIONAL CHANNELS WITH PRESCRIBED VELOCITY DISTRIBUTIONS ALONG THE CHANNEL WALLS. I - RELAXATION SOLUTIONS. John D. Stanitz. January 1952. 69p. diags., 6 tabs. (NACA TN 2593)

DESIGN OF TWO-DIMENSIONAL CHANNELS WITH PRESCRIBED VELOCITY DISTRIBUTIONS ALONG THE CHANNEL WALLS. II - SOLUTION BY GREEN'S FUNCTION. John D. Stanitz. January 1952. 35p. diags., 2 tabs. (NACA TN 2595)

EXPERIMENTAL STUDY OF ISOTHERMAL WAKE-FLOW CHARACTERISTICS OF VARIOUS FLAME-HOLDER SHAPES. George G. Younger, David S. Gabriel and William R. Mickelsen. January 1952. 45p. diags., photos., 2 tabs. (NACA RM E51K07)

CONCERNING THE FLOW ABOUT RING-SHAPED COWLINGS OF FINITE THICKNESS. Part I. (Über die Strömung an ringförmigen Verkleidungen endlicher Dicke). Dietrich Küchemann. January 1952. 24p. diags. (NACA TM 1325. Trans. from Zentrale für wissenschaftliches Berichtswesen über Luftfahrtforschung, Berlin. FB 1236, June 13, 1940).

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DIFFUSION OF HEAT FROM A LINE SOURCE IN ISOTROPIC TURBULENCE. Mahinder S. Uberoi and Stanley Corrsin, Johns Hopkins University. June 1952. 90p. diags., photos., tab. (NACA TN 2710)

THE EFFECT OF HIGH VISCOSITY ON THE FLOW AROUND A CYLINDER AND AROUND A SPHERE. (Der Einfluss grosser Zähigkeit bei der Strömung um den Zylinder und um die Kugel). F. Homann. June 1952. 29p. diags., tab. (NACA TM 1334. Trans. from Zeitschrift für angewandte Mathematik und Mechanik, v. 16, no. 3, June 1936, p. 153-164).

A BLADE-ELEMENT ANALYSIS FOR LIFTING ROTORS THAT IS APPLICABLE FOR LARGE INFLOW AND BLADE ANGLES AND ANY REASONABLE BLADE GEOMETRY. Walter Castles, Jr. and Noah C. New, Georgia Institute of Technology. July 1952. 63p. diags., 7 tabs. (NACA TN 2656)

ANALYSIS OF FLOW IN A SUBSONIC MIXED-FLOW IMPELLER. Chung-Hua Wu, Curtis A. Brown and Eleanor L. Costilow. August 1952. 38p. diags. (NACA TN 2749)

AVERAGE SKIN-FRICTION DRAG COEFFICIENTS FROM TANK TESTS OF A PARABOLIC BODY OF REVOLUTION (NACA RM-10). Elmo J. Mottard and J. Dan Loper. January 1953. 18p. diags., photos. (NACA TN 2854)

## AERODYNAMICS

### 4 FUNDAMENTAL (1.1)

#### Incompressible Flow (Cont.)

SPIRAL MOTIONS OF VISCOUS FLUIDS. (Spiralförmige Bewegungen zäher Flüssigkeiten). Georg Hamel. January 1953. 44p. (NACA TM 1342. Trans. from Deutsche Mathematiker-vereinigung, Jahresbericht, v. 25, 1917, p. 34-60).

IMPINGEMENT OF CLOUD DROPLETS ON AERODYNAMIC BODIES AS AFFECTED BY COMPRESSIBILITY OF AIR FLOW AROUND THE BODY. Rinaldo J. Brun, John S. Serafini and Helen M. Gallagher. March 1953. 20p. diags. (NACA TN 2903)

THE NORMAL COMPONENT OF THE INDUCED VELOCITY IN THE VICINITY OF A LIFTING ROTOR AND SOME EXAMPLES OF ITS APPLICATION. Walter Castles, Jr. and Jacob Henri De Leeuw, Georgia Institute of Technology. March 1953. 38p. diags., 3 tabs. (NACA TN 2912)

## COMPRESSIBLE FLOW

### (1.1.2)

TEMPERATURE SURVEY OF THE WAKE OF TWO CLOSELY LOCATED PARALLEL JETS. John L. Sloop and Gerald Morrell. February 6, 1950. 37p. diags., photos., 8 tabs. (NACA RM E9121) (Declassified from Confidential, 3/10/52)

INVESTIGATION OF HIGH-SUBSONIC PERFORMANCE CHARACTERISTICS OF A 12° 21-INCH CONICAL DIFFUSER, INCLUDING THE EFFECTS OF CHANGE IN INLET-BOUNDARY-LAYER THICKNESS. Martin R. Copp and Paul L. Klevatt. March 24, 1950. 51p. diags., photos. (NACA RM L9H10) (Declassified from Restricted, 6/11/53)

THE EFFECT OF CHANGES IN THE LEADING-EDGE RADIUS ON THE AERODYNAMIC CHARACTERISTICS OF A SYMMETRICAL, 9-PERCENT-THICK AIRFOIL AT HIGH-SUBSONIC MACH NUMBERS. Milton D. Humphreys and Raymond A. Robinson. August 7, 1950. 48p. diags., photos., tab. (NACA RM L9L09) (Declassified from Confidential, 5/25/53)

A COMPARISON OF THEORY AND EXPERIMENT FOR HIGH-SPEED FREE-MOLECULE FLOW. Jackson R. Stalder, Glen Goodwin and Marcus O. Creager. 1951. ii, 22p. diags., photos. (NACA Rept. 1032. Formerly NACA TN 2244)

ON THE PARTICULAR INTEGRALS OF THE PRANDTL-BUSEMANN ITERATION EQUATIONS FOR THE FLOW OF A COMPRESSIBLE FLUID. Carl Kaplan. 1951. ii, 6p. (NACA Rept. 1039. Formerly TN 2159)

AXIAL-MOMENTUM THEORY FOR PROPELLERS IN COMPRESSIBLE FLOW. (Corrected copy) Arthur W. Vogeley. July 1951. 12p. diags. (NACA TN 2164) (Supersedes TN 2164, August 1950)

THE INDICIAL LIFT AND PITCHING MOMENT FOR A SINKING OR PITCHING TWO-DIMENSIONAL WING FLYING AT SUBSONIC OR SUPERSONIC SPEEDS. Harvard Lomax, Max. A. Heaslet and Loma Sluder. July 1951. 56p. diags., tab. (NACA TN 2403)

METHOD OF ANALYSIS FOR COMPRESSIBLE FLOW PAST ARBITRARY TURBOMACHINE BLADES ON GENERAL SURFACE OF REVOLUTION. Chung-Hua Wu and Curtis A. Brown. July 1951. 42p. diags. (NACA TN 2407)

TRANSFORMATIONS OF THE HODOGRAPH FLOW EQUATION AND THE INTRODUCTION OF TWO GENERALIZED POTENTIAL FUNCTIONS: Luigi Crocco. August 1951. 81p. diags. (NACA TN 2432)

HEAT DELIVERY IN A COMPRESSIBLE FLOW AND APPLICATIONS TO HOT-WIRE ANEMOMETRY. Chan-Mou Tchen, National Bureau of Standards. August 1951. 63p. diags. (NACA TN 2436)

SOME MEASUREMENTS OF THE EFFECT OF GASEOUS IMPERFECTIONS ON THE CRITICAL PRESSURE RATIO IN AIR AND THE SPEED OF SOUND IN NITROGEN. Coleman duP. Donaldson and Jim J. Jones. August 1951. 15p. diags., photos., tab. (NACA TN 2437)

OPTICAL METHODS INVOLVING LIGHT SCATTERING FOR MEASURING SIZE AND CONCENTRATION OF CONDENSATION PARTICLES IN SUPERCOOLED HYPERSONIC FLOW. Enoch J. Durbin. August 1951. 28p. diags., photos., 2 tabs. (NACA TN 2441)

BEHAVIOR OF FAST MOVING FLOW OF COMPRESSIBLE GAS IN CYLINDRICAL PIPE IN PRESENCE OF COOLING. (K Voprosu o Povedenii Bystrodvizhushchegosya Potoka Szhimaemogo Gaza v Pryamoi Tsilindricheskoi Trube pri Nalichii Okhlazhdeniya). G. A. Varshavsky. September 1951. 8p. diags. (NACA TM 1274. Trans. from Zhurnal Tekhnicheskoi Fiziki, v.16, no.4, 1946, p.413-416).

RESISTANCE OF CASCADE OF AIRFOILS IN GAS STREAM AT SUBSONIC VELOCITY. (Soprotivlenie Reshetki Profilei v Gazovom Potoke s Dokriticheskimi Skorostiami). L. G. Loitsianskii. September 1951. 30p. diags. (NACA TM 1303. Trans. from Prikladnaya Matematika i Mekhanika, v.13, no.2, 1949).

GENERALIZATION OF JOUKOWSKI FORMULA TO AN AIRFOIL OF A CASCADE IN COMPRESSIBLE GAS STREAM WITH SUBSONIC VELOCITIES. (Obobshchenie Formuly Zhukovskogo na Sluchai Profilei v Reshetke Obtekaemoi Szhimaemym Gazom pri Dozvukovykh Skorostiakh). L. G. Loitsianskii. September 1951. 16p. diags. (NACA TM 1304. Trans. from Prikladnaya Matematika i Mekhanika, v.13, no.2, 1949, p.209-216).

EXPRESSIONS FOR MEASURING THE ACCURACY OF APPROXIMATE SOLUTIONS TO COMPRESSIBLE FLOW THROUGH CASCADES OF BLADES WITH EXAMPLES OF USE. John T. Sinnette, Jr., George R. Costello and Robert L. Cummings. October 1951. 33p. diags. (NACA TN 2501)

*Compressible Flow (Cont.)*

AN ANALYTIC DETERMINATION OF THE FLOW BEHIND A SYMMETRICAL CURVED SHOCK IN A UNIFORM STREAM. C. C. Lin and S. F. Shen, Massachusetts Institute of Technology. October 1951. 45p. diags. (NACA TN 2506)

CALCULATION OF HIGHER APPROXIMATIONS FOR TWO-DIMENSIONAL COMPRESSIBLE FLOW BY A SIMPLIFIED ITERATION PROCESS. W. H. Braun and M. M. Klein. October 1951. 54p. diags., 10 tabs. (NACA TN 2511)

SIMPLIFIED METHOD FOR CALCULATION OF COMPRESSIBLE LAMINAR BOUNDARY LAYER WITH ARBITRARY FREE-STREAM PRESSURE GRADIENT. George M. Low. October 1951. 28p. diags., 2 tabs. (NACA TN 2531)

STUDIES OF VON KÁRMÁN'S SIMILARITY THEORY AND ITS EXTENSION TO COMPRESSIBLE FLOWS. A SIMILARITY THEORY FOR TURBULENT BOUNDARY LAYER OVER A FLAT PLATE IN COMPRESSIBLE FLOW. C. C. Lin and S. F. Shen, Massachusetts Institute of Technology. November 1951. 37p. (NACA TN 2542)

STUDIES OF VON KÁRMÁN'S SIMILARITY THEORY AND ITS EXTENSION TO COMPRESSIBLE FLOWS. INVESTIGATION OF TURBULENT BOUNDARY LAYER OVER A FLAT PLATE IN COMPRESSIBLE FLOW BY THE SIMILARITY THEORY. S. F. Shen, Massachusetts Institute of Technology. November 1951. 43p. (NACA TN 2543)

METHOD OF ANALYSIS FOR COMPRESSIBLE FLOW THROUGH MIXED-FLOW CENTRIFUGAL IMPELLERS OF ARBITRARY DESIGN. Joseph T. Hamrick, Ambrose Ginsburg and Walter M. Osborn. 1952. ii, 10p. diags. (NACA Rept. 1082. Formerly NACA TN 2165)

HEAT TRANSFER TO BODIES IN A HIGH-SPEED RAREFIED-GAS STREAM. Jackson R. Stalder, Glen Goodwin and Marcus O. Creager. 1952. ii, 10p. diags., tab. (NACA Rept. 1093. Formerly TN 2438)

ON REFLECTION OF SHOCK WAVES FROM BOUNDARY LAYERS. H. W. Liepmann, A. Roshko and S. Dhawan, California Institute of Technology. 1952. ii, 29p. diags., photos., tab. (NACA Rept. 1100. Formerly TN 2334)

DIRECT MEASUREMENTS OF SKIN FRICTION. Satish Dhawan, California Institute of Technology. January 1952. 60p. diags., photos. (NACA TN 2567)

GENERAL CONSIDERATION OF PROBLEMS IN COMPRESSIBLE FLOW USING THE HODOGRAPH METHOD. Chieh-Chien Chang, Johns Hopkins University. January 1952. 113p. diags. (NACA TN 2582)

CALCULATIONS ON THE FORCES AND MOMENTS FOR AN OSCILLATING WING-AILERON COMBINATION IN TWO-DIMENSIONAL POTENTIAL FLOW AT SONIC SPEED. Herbert C. Nelson and Julian H. Berman. January 1952. 36p. diags., 2 tabs. (NACA TN 2590)

INVESTIGATION OF LAMINAR BOUNDARY LAYER IN COMPRESSIBLE FLUIDS USING THE CROCCO METHOD. E. R. Van Driest, North American Aviation, Inc. January 1952. 78p. diags., 3 tabs. (NACA TN 2597)

A GENERAL THEORY OF THREE-DIMENSIONAL FLOW IN SUBSONIC AND SUPERSONIC TURBOMACHINES OF AXIAL-, RADIAL-, AND MIXED-FLOW TYPES. Chung-Hua Wu. January 1952. 93p. diags., tab. (NACA TN 2604)

ONE-DIMENSIONAL COMPRESSIBLE FLOW IN VANELESS DIFFUSERS OF RADIAL- AND MIXED-FLOW CENTRIFUGAL COMPRESSORS, INCLUDING EFFECTS OF FRICTION, HEAT TRANSFER AND AREA CHANGE. John D. Stanitz. January 1952. 61p. diags., photo. (NACA TN 2610)

A COMPARISON OF THE EXPERIMENTAL SUBSONIC PRESSURE DISTRIBUTIONS ABOUT SEVERAL BODIES OF REVOLUTION WITH PRESSURE DISTRIBUTIONS COMPUTED BY MEANS OF THE LINEARIZED THEORY. Clarence W. Matthews. February 1952. 52p. diags., tab. (NACA TN 2519. Formerly RM L9F28)

EFFECT OF MACH NUMBER ON THE FLOW AND APPLICATION OF COMPRESSIBILITY CORRECTIONS IN A TWO-DIMENSIONAL SUBSONIC-TRANSONIC COMPRESSOR CASCADE HAVING VARIED POROUS-WALL SUCTION AT THE BLADE TIPS. William B. Briggs. March 1952. 43p. diags., photos. (NACA TN 2649)

CRITICAL STUDY OF INTEGRAL METHODS IN COMPRESSIBLE LAMINAR BOUNDARY LAYERS. Paul A. Libby, Morris Morduchow and Martin Bloom, Polytechnic Institute of Brooklyn. March 1952. 40p. diags., 3 tabs. (NACA TN 2655)

TWO-DIMENSIONAL SUBSONIC FLOW PAST ELLIPTIC CYLINDER BY THE VARIATIONAL METHOD. G. V. R. Rao, New York University. March 1952. 39p. diags., 3 tabs. (NACA TN 2666)

A COMPRESSIBLE-FLOW PLOTTING DEVICE AND ITS APPLICATION TO CASCADE FLOWS. Willard R. Westphal and James C. Dunavant. April 1952. 21p. diags., photos. (NACA TN 2681)

RECIPROCITY RELATIONS IN AERODYNAMICS. Max. A. Heaslet and John R. Spreiter. May 1952. 38p. diags. (NACA TN 2700)

AN APPROXIMATE METHOD OF DETERMINING THE SUBSONIC FLOW IN AN ARBITRARY STREAM FILAMENT OF REVOLUTION CUT BY ARBITRARY TURBOMACHINE BLADES. Chung-Hua Wu, Curtis A. Brown and Vasily D. Prian. June 1952. 46p. diags., 4 tabs. (NACA TN 2702)

TWO-DIMENSIONAL STEADY NONVISCOUS AND VISCOUS COMPRESSIBLE FLOW THROUGH A SYSTEM OF EQUIDISTANT BLADES. Hans J. Reissner, Leonard Meyerhoff and Martin Bloom, Polytechnic Institute of Brooklyn. June 1952. 48p. diags., 4 tabs. (NACA TN 2718)



## AERODYNAMICS

### 6 FUNDAMENTAL (1.1)

#### Compressible Flow (Cont.)

ON THE APPLICATION OF TRANSONIC SIMILARITY RULES. John R. Spreiter. June 1952. 45p. diags. (NACA TN 2726)

EXTENSION TO THE CASES OF TWO DIMENSIONAL AND SPHERICALLY SYMMETRIC FLOWS OF TWO PARTICULAR SOLUTIONS TO THE EQUATIONS OF MOTION GOVERNING UNSTEADY FLOW IN A GAS. (Estensione ai Casi di Simmetria Centrale Bi-e Tri-Dimensionale di Due Particolari Soluzioni delle Equazioni del Moto Gassoso Non Permanente). Lorenzo Poggi. June 1952. 6p. (NACA TM 1332. Trans. from Onore di Modesto Panetti, November 25, 1950.)

MATRIX AND RELAXATION SOLUTIONS THAT DETERMINE SUBSONIC THROUGH FLOW IN AN AXIAL-FLOW GAS TURBINE. Chung-Hua Wu. July 1952. 65p. diags., 7 tabs. (NACA TN 2750)

ANALYSIS OF FLOW IN A SUBSONIC MIXED-FLOW IMPELLER. Chung-Hua Wu, Curtis A. Brown and Eleanor L. Costilow. August 1952. 38p. diags. (NACA TN 2749)

AN APPROXIMATE METHOD FOR DETERMINING THE DISPLACEMENT EFFECTS AND VISCOUS DRAG OF LAMINAR BOUNDARY LAYERS IN TWO-DIMENSIONAL HYPERSONIC FLOW. Mitchel H. Bertram. September 1952. 41p. diags., photos., tab. (NACA TN 2773)

METHOD FOR CALCULATION OF COMPRESSIBLE LAMINAR BOUNDARY-LAYER CHARACTERISTICS IN AXIAL PRESSURE GRADIENT WITH ZERO HEAT TRANSFER. Morris Morduchow and Joseph H. Clarke, Polytechnic Institute of Brooklyn. September 1952. 43p. diags., 4 tabs. (NACA TN 2784)

A COMPARISON OF TWO METHODS OF LINEARIZED CHARACTERISTICS FOR A SIMPLE UNSTEADY FLOW. Roger D. Sullivan. September 1952. 28p. diags. (NACA TN 2794)

SECOND APPROXIMATION TO LAMINAR COMPRESSIBLE BOUNDARY LAYER ON FLAT PLATE IN SLIP FLOW. Stephen H. Maslen. November 1952. 38p. diag., tab. (NACA TN 2818)

DEVELOPMENT OF TURBULENCE-MEASURING EQUIPMENT. Leslie S. G. Kovácznay. National Bureau of Standards. January 1953. 86p. diags., photos. (NACA TN 2839)

UNSTEADY OBLIQUE INTERACTION OF A SHOCK WAVE WITH A PLANE DISTURBANCE. Franklin K. Moore. January 1953. 66p. diags. (NACA TN 2879)

ON THE STABILITY OF THE LAMINAR MIXING REGION BETWEEN TWO PARALLEL STREAMS IN A GAS. C. C. Lin, Massachusetts Institute of Technology. January 1953. 50p. diags., 5 tabs. (NACA TN 2887)

SOME EXACT SOLUTIONS OF TWO-DIMENSIONAL FLOWS OF COMPRESSIBLE FLUID WITH HODOGRAPH METHOD. Chieh-Chien Chang and Vivian O'Brien, Johns Hopkins University. February 1953. 63p. diags., 4 tabs. (NACA TN 2885)

EFFECTS OF PARALLEL-JET MIXING ON DOWNSTREAM MACH NUMBER AND STAGNATION PRESSURE WITH APPLICATION TO ENGINE TESTING IN SUPERSONIC TUNNELS. Harry Bernstein. March 1953. 26p. diags., photos. (NACA TN 2918)

THE ASYMMETRIC ADJUSTABLE SUPERSONIC NOZZLE FOR WIND-TUNNEL APPLICATION. H. Julian Allen. March 1953. 30p. diags., photos., 2 tabs. (NACA TN 2919. Formerly RM A8E17)

THE DESIGN OF VARIABLE MACH NUMBER ASYMMETRIC SUPERSONIC NOZZLES BY TWO PROCEDURES EMPLOYING INCLINED AND CURVED SONIC LINES. Clarence A. Syvertson and Raymond C. Savin. March 1953. 35p. diags., tab. (NACA TN 2922)

#### SUBSONIC FLOW (1.1.2.1)

ON THE THEORY OF OSCILLATING AIRFOILS OF FINITE SPAN IN SUBSONIC COMPRESSIBLE FLOW. Eric Reissner, Massachusetts Institute of Technology. 1950. ii, 9p. (NACA Rept. 1002. Formerly TN 1953)

THE EFFECT OF THE INLET MACH NUMBER AND INLET-BOUNDARY-LAYER THICKNESS ON THE PERFORMANCE OF A 23° CONICAL-DIFFUSER - TAIL-PIPE COMBINATION. Jerome Persh. March 21, 1950. 53p. diags. (NACA RM L9K10) (Declassified from Restricted, 6/11/53)

HIGH-SUBSONIC PERFORMANCE CHARACTERISTICS AND BOUNDARY-LAYER INVESTIGATIONS OF A 12° 10-INCH-INLET-DIAMETER CONICAL DIFFUSER. B. H. Little, Jr. and Stafford W. Wilbur. May 11, 1950. 62p. diags., photos. (NACA RM L50C02a) (Declassified from Restricted, 6/11/53)

ON THE PARTICULAR INTEGRALS OF THE PRANDTL-BUSEMANN ITERATION EQUATIONS FOR THE FLOW OF A COMPRESSIBLE FLUID. Carl Kaplan. 1951. ii, 6p. (NACA Rept. 1039. Formerly TN 2159)

THEORETICAL ANTISYMMETRIC SPAN LOADING FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS. John DeYoung. 1951. 36p. diags., 9 tabs. (NACA Rept. 1056. Formerly TN 2140)

ANALYSIS OF PURE-BENDING FLUTTER OF A CANTILEVER SWEEP WING AND ITS RELATION TO BENDING-TORSION FLUTTER. H. J. Cunningham. September 1951. 24p. diags. (NACA TN 2461)

BEHAVIOR OF FAST MOVING FLOW OF COMPRESSIBLE GAS IN CYLINDRICAL PIPE IN PRESENCE OF COOLING. (K Voprosu o Povedenii Bystrodvishushchegosya Potoka Szhimamogo Gaza v Pryamoi Tsilindricheskoj Trube pri Nalichii Okhlazhdeniya). G. A. Varshavsky. September 1951. 8p. diags. (NACA TM 1274. Trans. from Zhurnal Tekhnicheskoi Fiziki, v.16, no.4, 1946, p.413-416).

*Subsonic Flow - Compressible (Cont.)*

**CALCULATION OF HIGHER APPROXIMATIONS FOR TWO-DIMENSIONAL COMPRESSIBLE FLOW BY A SIMPLIFIED ITERATION PROCESS.** W. H. Braun and M. M. Klein. October 1951. 54p. diagrs., 10 tabs. (NACA TN 2511)

**DETAILED COMPUTATIONAL PROCEDURE FOR DESIGN OF CASCADE BLADES WITH PRESCRIBED VELOCITY DISTRIBUTIONS IN COMPRESSIBLE POTENTIAL FLOWS.** George R. Costello, Robert L. Cummings and John T. Sinnette, Jr. 1952. ii, 14p. diagrs., 9 tabs. (NACA Rept. 1060. Formerly TN 2281)

**ON A SOLUTION OF THE NONLINEAR DIFFERENTIAL EQUATION FOR TRANSONIC FLOW PAST A WAVE-SHAPED WALL.** Carl Kaplan. 1952. ii, 11p. diagrs., tab. (NACA Rept. 1069. Formerly TN 2383)

**THEORETICAL SYMMETRIC SPAN LOADING DUE TO FLAP DEFLECTION FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS.** John DeYoung. 1952. ii, 41p. diagrs., tabs. (NACA Rept. 1071. Formerly NACA TN 2278)

**DIRECT MEASUREMENTS OF SKIN FRICTION.** Satish Dhawan, California Institute of Technology. January 1952. 60p. diagrs., photos. (NACA TN 2567)

**THE EFFECTS OF REYNOLDS NUMBER ON THE APPLICATION OF NACA 16-SERIES AIRFOIL CHARACTERISTICS TO PROPELLER DESIGN.** Harold E. Cleary. January 1952. 15p. diagrs. (NACA TN 2591. Formerly RM L7H12)

**DESIGN OF TWO-DIMENSIONAL CHANNELS WITH PRESCRIBED VELOCITY DISTRIBUTIONS ALONG THE CHANNEL WALLS. I - RELAXATION SOLUTIONS.** John D. Stanitz. January 1952. 69p. diagrs., 6 tabs. (NACA TN 2593)

**DESIGN OF TWO-DIMENSIONAL CHANNELS WITH PRESCRIBED VELOCITY DISTRIBUTIONS ALONG THE CHANNEL WALLS. II - SOLUTION BY GREEN'S FUNCTION.** John D. Stanitz. January 1952. 35p. diagrs., 2 tabs. (NACA TN 2595)

**A COMPARISON OF THE EXPERIMENTAL SUBSONIC PRESSURE DISTRIBUTIONS ABOUT SEVERAL BODIES OF REVOLUTION WITH PRESSURE DISTRIBUTIONS COMPUTED BY MEANS OF THE LINEARIZED THEORY.** Clarence W. Matthews. February 1952. 52p. diagrs., tab. (NACA TN 2519. Formerly RM L9F28)

**WIND-TUNNEL CORRECTIONS AT HIGH SUBSONIC SPEEDS PARTICULARLY FOR AN ENCLOSED CIRCULAR TUNNEL.** (Windkanalkorrekturen bei hohen Unterschallgeschwindigkeiten unter besonderer Berücksichtigung des geschlossenen kreiskanals). B. Göthert. February 1952. 43p. diagrs., 3 tabs. (NACA TM 1300. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1216; Deutsche Versuchsanstalt für Luftfahrt E. V., Berlin. Institut für Aerodynamik, May 16, 1940).

**EFFECT OF COMPRESSIBILITY ON THE FLOW PAST A TWO-DIMENSIONAL BUMP.** W. F. Lindsey and Bernard N. Daley. April 1952. 34p. diagrs., photos. (NACA TN 2484. Formerly RM L6K12b)

**CHOKING OF A SUBSONIC INDUCTION TUNNEL BY THE FLOW FROM AN INDUCTION NOZZLE.** W. F. Lindsey. July 1952. 20p. diagrs. (NACA TN 2730)

**INVESTIGATION OF THE INFLUENCE OF FUSELAGE AND TAIL SURFACES ON LOW-SPEED STATIC STABILITY AND ROLLING CHARACTERISTICS OF A SWEEP-WING MODEL.** John D. Bird, Jacob H. Lichtenstein and Byron M. Jaquet. July 1952. 18p. diagrs., photo. (NACA TN 2741. Formerly RM L7H15)

**ON TRANSONIC FLOW PAST A WAVE-SHAPED WALL.** Carl Kaplan. August 1952. 43p. diagrs. (NACA TN 2748)

**EFFECTS OF MACH NUMBER VARIATION BETWEEN 0.07 AND 0.34 AND REYNOLDS NUMBER VARIATION BETWEEN  $0.97 \times 10^6$  AND  $8.10 \times 10^6$  ON THE MAXIMUM LIFT COEFFICIENT OF A WING OF NACA 64-210 AIRFOIL SECTIONS.** James E. Fitzpatrick and William C. Schneider. August 1952. 34p. diagrs., photos., tab. (NACA TN 2753)

**A COMPARATIVE EXAMINATION OF SOME MEASUREMENTS OF AIRFOIL SECTION LIFT AND DRAG AT SUPERCRITICAL SPEEDS.** Gerald E. Nitzberg and Stewart M. Crandall. November 1952. 30p. diagrs. (NACA TN 2825)

**EXPERIMENTAL INVESTIGATION OF LOSS IN AN ANNULAR CASCADE OF TURBINE-NOZZLE BLADES OF FREE VORTEX DESIGN.** Hubert W. Allen, Milton G. Kofskey and Richard E. Chamness. January 1953. 33p. diagrs., photos., tab. (NACA TN 2871)

**A RAPID METHOD FOR ESTIMATING THE SEPARATION POINT OF A COMPRESSIBLE LAMINAR BOUNDARY LAYER.** Laurence K. Loftin, Jr. and Homer B. Wilson, Jr. February 1953. 19p. diagrs. (NACA TN 2892)

**IMPINGEMENT OF CLOUD DROPLETS ON AERODYNAMIC BODIES AS AFFECTED BY COMPRESSIBILITY OF AIR FLOW AROUND THE BODY.** Rinaldo J. Brun, John S. Serafini and Helen M. Gallagher. March 1953. 20p. diagrs. (NACA TN 2903)

**STUDY OF SECONDARY-FLOW PATTERNS IN AN ANNULAR CASCADE OF TURBINE NOZZLE BLADES WITH VORTEX DESIGN.** Harold E. Rohlik, Hubert W. Allen and Howard Z. Herzig. March 1953. 29p. diagrs., photos. (NACA TN 2909)

**ON THE DEVELOPMENT OF TURBULENT WAKES FROM VORTEX STREETS.** Anatol Roshko, California Institute of Technology. March 1953. 77p. diagrs., photos., 3 tabs. (NACA TN 2913)

**PRESSURE DISTRIBUTIONS ABOUT FINITE WEDGES IN BOUNDED AND UNBOUNDED SUBSONIC STREAMS.** Patrick L. Donoughe and Ernst I. Prasse. May 1953. 41p. diagrs., photos., 2 tabs. (NACA TN 2942)

AERODYNAMICS  
8 FUNDAMENTAL (1.1)

MIXED FLOW  
(1.1.2.2)

**THE LANGLEY ANNULAR TRANSONIC TUNNEL AND PRELIMINARY TESTS OF AN NACA 66-006 AIRFOIL.** Louis W. Habel. June 23, 1948. 23p. diags., photos. (NACA RM L8A23) (Declassified from Confidential, 7/20/51)

**ANALYSIS OF MEASURED PRESSURES ON AIRFOILS AT MACH NUMBERS NEAR 1.** Louis W. Habel and Mason F. Miller. September 19, 1949. 25p. diags. (NACA RM L9G19) (Declassified from Confidential, 7/20/51)

**APPROXIMATE RELATIVE-TOTAL-PRESSURE LOSSES OF AN INFINITE CASCADE OF SUPERSONIC BLADES WITH FINITE LEADING-EDGE THICKNESS.** John F. Klapproth. March 3, 1950. 8p. diags. (NACA RM E9L21) (Declassified from Restricted, 4/13/53)

**PRELIMINARY INVESTIGATION OF AIRFOIL CHARACTERISTICS IN THE LANGLEY ANNULAR TRANSONIC TUNNEL.** Louis W. Habel and James H. Henderson. August 11, 1950. 21p. diags. (NACA RM L50E18) (Declassified from Confidential, 7/20/51)

**METHOD OF DETERMINING INITIAL TANGENTS OF CONTOURS OF FLOW VARIABLES BEHIND A CURVED, AXIALLY SYMMETRIC SHOCK WAVE.** George P. Wood and Paul B. Gooderum. July 1951. 44p. diags., photo. (NACA TN 2411)

**SCHLIEREN INVESTIGATION OF THE WING SHOCK-WAVE BOUNDARY-LAYER INTERACTION IN FLIGHT.** George E. Cooper and Richard S. Bray. September 1951. 26p. diags., photos. (NACA RM A51G09)

**AN ANALYTIC DETERMINATION OF THE FLOW BEHIND A SYMMETRICAL CURVED SHOCK IN A UNIFORM STREAM.** C. C. Lin and S. F. Shen, Massachusetts Institute of Technology. October 1951. 45p. diags. (NACA TN 2506)

**A VELOCITY-CORRECTION FORMULA FOR THE CALCULATION OF TRANSONIC MACH NUMBER DISTRIBUTIONS OVER DIAMOND-SHAPED AIRFOILS.** H. Reese Ivey and Keith C. Harder. November 1951. 28p. diags. (NACA TN 2527)

**APPLICATION OF VARIATIONAL METHODS TO TRANSONIC FLOWS WITH SHOCK WAVES.** Chi-Teh Wang and Pei-Chi Chou, New York University. November 1951. 32p. diags., 4 tabs. (NACA TN 2539)

**AN INVESTIGATION BY THE HODOGRAPH METHOD OF FLOW THROUGH A SYMMETRICAL NOZZLE WITH LOCALLY SUPERSONIC REGIONS.** F. Edward Ehlers and Hirsch G. Cohen, Brown University. November 1951. 61p. diags., 2 tabs. (NACA TN 2547)

**AN EXPERIMENTAL INVESTIGATION OF TRANSONIC FLOW PAST TWO-DIMENSIONAL WEDGE AND CIRCULAR-ARC SECTIONS USING A MACH-ZEHNDER INTERFEROMETER.** Arthur Earl Bryson, Jr., California Institute of Technology. November 1951. 97p. diags., photos. (NACA TN 2560)

**ON A SOLUTION OF THE NONLINEAR DIFFERENTIAL EQUATION FOR TRANSONIC FLOW PAST A WAVE-SHAPED WALL.** Carl Kaplan. 1952. ii, 11p. diags., tab. (NACA Rept. 1069. Formerly TN 2383)

**TRANSONIC FLOW PAST A WEDGE PROFILE WITH DETACHED BOW WAVE.** Walter G. Vincenti and Cleo B. Wagoner. 1952. ii, 30p. diags., tab. (NACA Rept. 1095. Formerly TN 2339; TN 2588)

**ON REFLECTION OF SHOCK WAVES FROM BOUNDARY LAYERS.** H. W. Liepmann, A. Roshko and S. Dhawan, California Institute of Technology. 1952. ii, 29p. diags., photos., tab. (NACA Rept. 1100. Formerly TN 2334)

**A COMPARISON OF THE EXPERIMENTAL SUBSONIC PRESSURE DISTRIBUTIONS ABOUT SEVERAL BODIES OF REVOLUTION WITH PRESSURE DISTRIBUTIONS COMPUTED BY MEANS OF THE LINEARIZED THEORY.** Clarence W. Matthews. February 1952. 52p. diags., tab. (NACA TN 2519. Formerly RM L9F28)

**GENERALIZED LINEARIZED CONICAL FLOW.** W. D. Hayes, R. C. Roberts and N. Haaser, Brown University. March 1952. 48p. diags., tab. (NACA TN 2667)

**EFFECT OF COMPRESSIBILITY ON THE FLOW PAST A TWO-DIMENSIONAL BUMP.** W. F. Lindsey and Bernard N. Daley. April 1952. 34p. diags., photos. (NACA TN 2484. Formerly RM L6K12b)

**APPLICATION OF TRANSONIC SIMILARITY.** Adolf Busemann. April 1952. 22p. diags. (NACA TN 2687)

**FLOW CHARACTERISTICS OVER A LIFTING WEDGE OF FINITE ASPECT RATIO WITH ATTACHED AND DETACHED SHOCK WAVES AT A MACH NUMBER OF 1.40.** John H. Hilton, Jr. June 1952. 21p. diags., photos. (NACA TN 2712)

**TRANSONIC SIMILARITY RULES FOR LIFTING WINGS.** Keith C. Harder. June 1952. 26p. diagr. (NACA TN 2724)

**EFFECTS OF ASPECT RATIO ON AIR FLOW AT HIGH SUBSONIC MACH NUMBERS.** W. F. Lindsey and Milton D. Humphreys. July 1952. 10p. photos., diags. (NACA TN 2720. Formerly NACA RM L8G23)

**ON TRANSONIC FLOW PAST A WAVE-SHAPED WALL.** Carl Kaplan. August 1952. 43p. diags. (NACA TN 2748)

**A FLIGHT INVESTIGATION OF THE EFFECT OF SHAPE AND THICKNESS OF THE BOUNDARY LAYER ON THE PRESSURE DISTRIBUTION IN THE PRESENCE OF SHOCK.** Eziaslav N. Harrin. September 1952. 13p. diags., photos. (NACA TN 2765)

**A STUDY OF THE TRANSIENT BEHAVIOR OF SHOCK WAVES IN TRANSONIC CHANNEL FLOWS.** Robert V. Hess. October 1952. 32p. diags. (NACA TN 2797)

**INVESTIGATION WITH AN INTERFEROMETER OF THE FLOW AROUND A CIRCULAR-ARC AIRFOIL AT MACH NUMBERS BETWEEN 0.6 AND 0.9.** George P. Wood and Paul B. Gooderum. October 1952. 80p. diags., photos., tab. (NACA TN 2801)

*Mixed Flow - Compressible (Cont.)*

A COMPARATIVE EXAMINATION OF SOME MEASUREMENTS OF AIRFOIL SECTION LIFT AND DRAG AT SUPERCRITICAL SPEEDS. Gerald E. Nitzberg and Stewart M. Crandall. November 1952. 30p. diags. (NACA TN 2825)

EXPERIMENTS ON TRANSONIC FLOW AROUND WEDGES. George P. Wood. November 1952. 34p. diags., photos., tab. (NACA TN 2829)

THEORETICAL STUDY OF THE TRANSONIC LIFT OF A DOUBLE-WEDGE PROFILE WITH DETACHED BOW WAVE. Walter G. Vincenti and Cleo B. Wagoner. (Portions of this work were reported at the eighth International Congress on Theoretical and Applied Mechanics, Istanbul, Turkey, August 20-28, 1952). December 1952. 63p. diags., 2 tabs. (NACA TN 2832)

REFLECTION OF A WEAK SHOCK WAVE FROM A BOUNDARY LAYER ALONG A FLAT PLATE. I - INTERACTION OF WEAK SHOCK WAVES WITH LAMINAR AND TURBULENT BOUNDARY LAYERS ANALYZED BY MOMENTUM-INTEGRAL METHOD. Alfred Ritter and Yung-Huai Kuo, Cornell University. January 1953. 66p. diags., tab. (NACA TN 2868)

REFLECTION OF WEAK SHOCK WAVE FROM A BOUNDARY LAYER ALONG A FLAT PLATE. II - INTERACTION OF OBLIQUE SHOCK WAVE WITH A LAMINAR BOUNDARY LAYER ANALYZED BY DIFFERENTIAL-EQUATION METHOD. Yung-Huai Kuo, Cornell University. January 1953. 60p. diags. (NACA TN 2869)

AN APPLICATION OF THE METHOD OF CHARACTERISTICS TO TWO-DIMENSIONAL TRANSONIC FLOWS WITH DETACHED SHOCK WAVES. Keith C. Harder and E. B. Klunker. March 1953. 16p. diags. (NACA TN 2910)

### SUPERSONIC FLOW (1.1.2.3)

INVESTIGATION OF TWO PITOT-STATIC TUBES AT SUPERSONIC SPEEDS. Lowell E. Hasel and Donald E. Coletti. November 19, 1948. 24p. diags. (NACA RM L8102) (Declassified from Confidential, 6/4/52)

PRESSURE DISTRIBUTIONS ON THIN CONICAL BODY OF ELLIPTIC CROSS SECTION AT MACH NUMBER 1.89. Stephen H. Maslen. January 20, 1949. 18p. diags., photo. (NACA RM E8K05) (Declassified from Confidential, 6/11/53)

PERFORMANCE OF 24-INCH SUPERSONIC AXIAL-FLOW COMPRESSOR IN AIR. II - PERFORMANCE OF COMPRESSOR ROTOR AT EQUIVALENT TIP SPEEDS FROM 800 TO 1765 FEET PER SECOND. Irving A. Johnsen, Linwood C. Wright and Melvin J. Hartmann. January 21, 1949. 31p. diags. (NACA RM E8G01) (Declassified from Restricted, 4/13/53)

PRELIMINARY ANALYSIS OF AXIAL-FLOW COMPRESSORS HAVING SUPERSONIC VELOCITY AT THE ENTRANCE OF THE STATOR. Antonio Ferri. September 12, 1949. 36p. diags. (NACA RM L9G06) (Declassified from Confidential, 4/13/53)

ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF 90° SUPERSONIC TURNING PASSAGES SUITABLE FOR SUPERSONIC COMPRESSORS OR TURBINES. Luke L. Liccini. September 12, 1949. 91p. photos., diags., 3 tabs. (NACA RM L9G07) (Declassified from Confidential, 4/13/53)

ANALYSIS OF MEASURED PRESSURES ON AIRFOILS AT MACH NUMBERS NEAR 1. Louis W. Habel and Mason F. Miller. September 19, 1949. 25p. diags. (NACA RM L9G19) (Declassified from Confidential, 7/20/51)

CHARACTERISTICS OF PERFORATED DIFFUSERS AT FREE-STREAM MACH NUMBER 1.90. Henry R. Hunczak and Emil J. Kremzier. May 8, 1950. 69p. diags., photos. (NACA RM E50B02) (Declassified from Confidential, 6/11/53)

EXPERIMENTAL INVESTIGATION OF THE MIXING LOSS BEHIND THE TRAILING EDGE OF A CASCADE OF THREE 90° SUPERSONIC TURNING PASSAGES. Luke L. Liccini. August 15, 1950. 31p. diags., photos., tab. (NACA RM L50F21a) (Declassified from Confidential, 4/13/53)

INVESTIGATION OF A SHROUDED AND AN UNSHROUDED AXIAL-FLOW SUPERSONIC COMPRESSOR. Emanuel Boxer and John R. Erwin. September 15, 1950. 54p. diags., photos., tab. (NACA RM L50G05) (Declassified from Confidential, 4/13/53)

INVESTIGATION OF THE PRESSURE-RATIO REQUIREMENTS OF THE LANGLEY 11-INCH SUPERSONIC TUNNEL WITH A VARIABLE-GEOMETRY DIFFUSER. Mitchel H. Bertram. October 6, 1950. 19p. diags. (NACA RM L50H3) (Declassified from Confidential, 3/10/52)

A LIFT-CANCELLATION TECHNIQUE IN LINEARIZED SUPERSONIC-WING THEORY. Harold Mirels. 1951. ii, 11p. diags. (NACA Rept. 1004. Formerly TN 2145)

A COMPARISON OF THEORY AND EXPERIMENT FOR HIGH-SPEED FREE-MOLECULE FLOW. Jackson R. Stalder, Glen Goodwin and Marcus O. Creager. 1951. ii, 22p. diags., photos. (NACA Rept. 1032. Formerly NACA TN 2244)

COMPARISON BETWEEN THEORY AND EXPERIMENT FOR WINGS AT SUPERSONIC SPEEDS. Walter G. Vincenti. 1951. ii, 11p. diags., photos. (NACA Rept. 1033. Formerly TN 2100)

ON THE PARTICULAR INTEGRALS OF THE PRANDTL-BUSEMANN ITERATION EQUATIONS FOR THE FLOW OF A COMPRESSIBLE FLUID. Carl Kaplan. 1951. ii, 6p. (NACA Rept. 1039. Formerly TN 2159)

THE METHOD OF CHARACTERISTICS FOR THE DETERMINATION OF SUPERSONIC FLOW OVER BODIES OF REVOLUTION AT SMALL ANGLES OF ATTACK. Antonio Ferri. 1951. ii, 16p. diags. (NACA Rept. 1044. Formerly TN 1809)

SUPERSONIC FLOW AROUND CIRCULAR CONES AT ANGLES OF ATTACK. Antonio Ferri. 1951. ii, 11p. diags. (NACA Rept. 1045. Formerly TN 2236)

FORMULAS FOR THE SUPERSONIC LOADING, LIFT AND DRAG OF FLAT SWEEPED-BACK WINGS WITH LEADING EDGES BEHIND THE MACH LINES. Doris Cohen. 1951. iii, 40p. diags. (NACA Rept. 1050)

**AERODYNAMICS**  
**10 FUNDAMENTAL (1.1)**

**Supersonic Flow - Compressible (Cont.)**

AN ANALYSIS OF BASE PRESSURE AT SUPERSONIC VELOCITIES AND COMPARISON WITH EXPERIMENT. Dean R. Chapman. 1951. ii, 23p. diagrs., photos. (NACA Rept. 1051. Formerly TN 2137)

APPLICABILITY OF THE HYPERSONIC SIMILARITY RULE TO PRESSURE DISTRIBUTIONS WHICH INCLUDE THE EFFECTS OF ROTATION FOR BODIES OF REVOLUTION AT ZERO ANGLE OF ATTACK. Vernon J. Rossow. (Extension of TN 2250) June 1951. 28p. diagrs. (NACA TN 2399)

METHOD OF DETERMINING INITIAL TANGENTS OF CONTOURS OF FLOW VARIABLES BEHIND A CURVED, AXIALLY SYMMETRIC SHOCK WAVE. George P. Wood and Paul B. Gooderum. July 1951. 44p. diagrs., photo. (NACA TN 2411)

FLOW SEPARATION AHEAD OF BLUNT BODIES AT SUPERSONIC SPEEDS. W. E. Moeckel. July 1951. 39p. diagrs., photos. (NACA TN 2418)

THE SIMILARITY LAW FOR HYPERSONIC FLOW ABOUT SLENDER THREE-DIMENSIONAL SHAPES. Frank M. Hamaker, Stanford E. Neice and A. J. Eggers, Jr. August 1951. 22p. diagrs. (NACA TN 2443)

THEORETICAL FORCE AND MOMENTS DUE TO SIDESLIP OF A NUMBER OF VERTICAL TAIL CONFIGURATIONS AT SUPERSONIC SPEEDS. John C. Martin and Frank S. Malvestuto, Jr. September 1951. 60p. diagrs., photos. (NACA TN 2412)

A METHOD OF SOLVING THE DIRECT AND INVERSE PROBLEM OF SUPERSONIC FLOW ALONG ARBITRARY STREAM FILAMENTS OF REVOLUTION IN TURBOMACHINES. Chung-Hua Wu and Eleanor L. Costilow. September 1951. 25p. diagrs. (NACA TN 2492)

GENERALIZED CONICAL-FLOW FIELDS IN SUPERSONIC WING THEORY. Harvard Lomax and Max. A. Heaslet. September 1951. 45p. diagrs. (NACA TN 2497)

BEHAVIOR OF FAST MOVING FLOW OF COMPRESSIBLE GAS IN CYLINDRICAL PIPE IN PRESENCE OF COOLING. (K Voprosu o Povedenii Bystrodvizhushchegosya Potoka Szhimae-mogo Gaza v Pryamoi Tsilindricheskoj Trube pri Nalichii Okhlazhdenia). G. A. Varshavsky. September 1951. 8p. diagrs. (NACA TM 1274. Trans. from Zhurnal Tekhnicheskoi Fiziki, v.16, no.4, 1946, p.413-416).

THE AERODYNAMIC BEHAVIOR OF A HARMONICALLY OSCILLATING FINITE SWEEPBACK WING IN SUPERSONIC FLOW. Chieh-Chien Chang, Johns Hopkins University. October 1951. 76p. diagrs. (NACA TN 2467)

LAMINAR FRICTION AND HEAT TRANSFER AT MACH NUMBERS FROM 1 TO 10. E. B. Klunker and F. Edward McLean. October 1951. 22p. diagrs. (NACA TN 2499)

ON THE ATTACHED CURVED SHOCK IN FRONT OF A SHARP-NOSED AXIALLY SYMMETRICAL BODY PLACED IN A UNIFORM STREAM: S. F. Shen and C. C. Lin, Massachusetts Institute of Technology. October 1951. 66p. diagrs. 2 tabs. (NACA TN 2505)

THE LINEARIZED CHARACTERISTICS METHOD AND ITS APPLICATION TO PRACTICAL NON-LINEAR SUPERSONIC PROBLEMS. Antonio Ferri. October 1951. 65p. diagrs. (NACA TN 2515)

LAMINAR BOUNDARY LAYER ON A CIRCULAR CONE IN SUPERSONIC FLOW AT A SMALL ANGLE OF ATTACK. Franklin K. Moore. October 1951. 44p. diagrs., tab. (NACA TN 2521)

MINIMUM WAVE DRAG OF BODIES OF REVOLUTION WITH A CYLINDRICAL CENTER SECTION. Franklyn B. Fuller and Benjamin R. Briggs. October 1951. 34p. diagrs. (NACA TN 2535)

DETERMINATION OF SHAPES OF BOATTAIL BODIES OF REVOLUTION FOR MINIMUM WAVE DRAG. Mac C. Adams. November 1951. 20p. diagrs. (NACA TN 2550)

THEORETICAL AND EXPERIMENTAL INVESTIGATION OF CONDENSATION OF AIR IN HYPERSONIC WIND TUNNELS. H. Guyford Stever and Kenneth C. Rathbun, Massachusetts Institute of Technology. November 1951. 79p. diagrs., photos. (NACA TN 2559)

AN EXPERIMENTAL INVESTIGATION OF TRANS-ONIC FLOW PAST TWO-DIMENSIONAL WEDGE AND CIRCULAR-ARC SECTIONS USING A MACH-ZEHNDER INTERFEROMETER. Arthur Earl Bryson, Jr., California Institute of Technology. November 1951. 97p. diagrs., photos. (NACA TN 2560)

CRITERIONS FOR CONDENSATION-FREE FLOW IN SUPERSONIC TUNNELS. Warren C. Burgess, Jr. and Ferris L. Seashore. December 1951. 39p. diagrs., photos., tab. (NACA TN 2518. Formerly RM E9E02)

APPROXIMATE METHODS FOR CALCULATING THE FLOW ABOUT NONLIFTING BODIES OF REVOLUTION AT HIGH SUPERSONIC AIRSPEEDS. A. J. Eggers, Jr. and Raymond C. Savin. December 1951. 40p. diagrs. (NACA TN 2579)

AIRFOIL PROFILES FOR MINIMUM PRESSURE DRAG AT SUPERSONIC VELOCITIES-GENERAL ANALYSIS WITH APPLICATION TO LINEARIZED SUPERSONIC FLOW. Dean R. Chapman. 1952. ii, 14p. diagrs. (NACA Rept. 1063. Formerly TN 2264)

A STUDY OF SECOND-ORDER SUPERSONIC FLOW THEORY. Milton D. Van Dyke. 1952. ii, 23p. diagrs. (NACA Rept. 1081. Formerly TN 2200)

AXISYMMETRIC SUPERSONIC FLOW IN ROTATING IMPELLERS. Arthur W. Goldstein. 1952. ii, 14p. diagrs. (NACA Rept. 1083. Formerly TN 2388)

HEAT TRANSFER TO BODIES IN A HIGH-SPEED RAREFIED-GAS STREAM. Jackson R. Stalder, Glen Goodwin and Marcus O. Creager. 1952. ii, 10p. diagrs., tab. (NACA Rept. 1093. Formerly TN 2438)

ON REFLECTION OF SHOCK WAVES FROM BOUNDARY LAYERS. H. W. Liepmann, A. Roshko and S. Dhawan, California Institute of Technology. 1952. ii, 29p. diagrs., photos., tab. (NACA Rept. 1100. Formerly TN 2334)

ORIENTATION OF ORIFICES ON BODIES OF REVOLUTION FOR DETERMINATION OF STREAM STATIC PRESSURE AT SUPERSONIC SPEEDS. Morton Cooper and Clyde V. Hamilton. January 1952. 26p. diagrs., photo., tab. (NACA TN 2592)



*Supersonic Flow - Compressible (Cont.)*

ESTIMATE OF SLIP EFFECT ON COMPRESSIBLE LAMINAR-BOUNDARY-LAYER SKIN FRICTION. Harold Mirels. January 1952. 22p. diags. (NACA TN 2609)

THE ACHIEVEMENT OF CONTINUOUS WALL CURVATURE IN DESIGN OF TWO-DIMENSIONAL SYMMETRICAL SUPERSONIC NOZZLES. J. C. Evvard and Lawrence R. Marcus. January 1952. 8p. diags. (NACA TN 2616)

SOME REMARKS ON AN APPROXIMATE METHOD OF ESTIMATING THE WAVE DRAG DUE TO THICKNESS AT SUPERSONIC SPEEDS OF THREE-DIMENSIONAL WINGS WITH ARBITRARY PROFILE. Kenneth Margolis. February 1952. 9p. (NACA TN 2619)

COMPARISON OF SUPERSONIC MINIMUM-DRAG AIRFOILS DETERMINED BY LINEAR AND NON-LINEAR THEORY. E. B. Klunker and Keith C. Harder. February 1952. 19p. diags. (NACA TN 2623)

THE SIMILARITY LAW FOR NONSTEADY HYPERSONIC FLOWS AND REQUIREMENTS FOR THE DYNAMICAL SIMILARITY OF RELATED BODIES IN FREE FLIGHT. Frank M. Hamaker and Thomas J. Wong. February 1952. 24p. diags. (NACA TN 2631)

ON ROTATIONAL CONICAL FLOW. (Sui Moti Conici Rotazionali). Carlo Ferrari. February 1952. 12p. diags. (NACA TM 1333. Trans. from Onore di Modesto Panetti, November 25, 1950).

INVISCID FLOW ABOUT AIRFOILS AT HIGH SUPERSONIC SPEEDS. A. J. Eggers, Jr. and Clarence A. Syvertson. March 1952. 65p. diags., tab. (NACA TN 2646)

SUPERSONIC CONICAL FLOW. Stephen H. Maslen, Brown University. March 1952. 32p. diags., tab. (NACA TN 2651)

APPROXIMATE THEORY FOR CALCULATION OF LIFT OF BODIES, AFTERBODIES, AND COMBINATIONS OF BODIES. Barry Moskowitz. April 1952. 39p. diags. (NACA TN 2669)

WING-BODY INTERFERENCE AT SUPERSONIC SPEEDS WITH AN APPLICATION TO COMBINATIONS WITH RECTANGULAR WINGS. Jack N. Nielsen and William C. Pitts. April 1952. 63p. diags., 2 tabs. (NACA TN 2677)

THREE-DIMENSIONAL SUPERSONIC NOZZLES AND INLETS OF ARBITRARY EXIT CROSS SECTION. John C. Evvard and Stephen H. Maslen. April 1952. 12p. diags. (NACA TN 2688)

CONDENSATION OF AIR IN SUPERSONIC WIND TUNNELS AND ITS EFFECTS ON FLOW ABOUT MODELS. C. Frederick Hansen and George J. Nothwang. April 1952. 49p. photos., diags. (NACA TN 2690)

APPLICATION OF SUPERSONIC VORTEX-FLOW THEORY TO THE DESIGN OF SUPERSONIC IMPULSE COMPRESSOR- OR TURBINE-BLADE SECTIONS. Emanuel Boxer, James R. Sterrett and John Wlodarski. April 24, 1952. 70p. diags., photos., 4 tabs. (NACA RM L52B06) (Declassified from Confidential, 4/13/53)

ON THE FORM OF THE TURBULENT SKIN-FRICTION LAW AND ITS EXTENSION TO COMPRESSIBLE FLOWS. Coleman duP. Donaldson. May 1952. 19p. diags. (NACA TN 2692)

A VECTOR STUDY OF LINEARIZED SUPERSONIC FLOW APPLICATIONS TO NONPLANAR PROBLEMS. John C. Martin. June 1952. 81p. diags., tab. (NACA TN 2641)

THEORY OF SUPERSONIC POTENTIAL FLOW IN TURBOMACHINES. Robert H. Wasserman. June 1952. 44p. diags. (NACA TN 2705)

FLOW CHARACTERISTICS OVER A LIFTING WEDGE OF FINITE ASPECT RATIO WITH ATTACHED AND DETACHED SHOCK WAVES AT A MACH NUMBER OF 1.40. John H. Hilton, Jr. June 1952. 21p. diags., photos. (NACA TN 2712)

USE OF THE BOUNDARY LAYER OF A CONE TO MEASURE SUPERSONIC FLOW INCLINATION. Franklin K. Moore. June 1952. 21p. diags. (NACA TN 2723)

INTERACTION OF OBLIQUE SHOCK WAVES WITH REGIONS OF VARIABLE PRESSURE, ENTROPY, AND ENERGY. W. E. Moeckel. June 1952. 34p. diags. (NACA TN 2725)

AN ANALYSIS OF SUPERSONIC FLOW IN THE REGION OF THE LEADING EDGE OF CURVED AIRFOILS, INCLUDING CHARTS FOR DETERMINING SURFACE-PRESSURE GRADIENT AND SHOCK-WAVE CURVATURE. Samuel Kraus. June 1952. 45p. diags., 5 tabs. (NACA TN 2729)

PRELIMINARY SURVEY OF BOUNDARY-LAYER DEVELOPMENT AT A NOMINAL MACH NUMBER OF 5.5. Harold L. Bloom. June 1952. 26p. diags., photos. (NACA RM E52D03)

SPAN LOAD DISTRIBUTIONS RESULTING FROM ANGLE OF ATTACK, ROLLING, AND PITCHING FOR TAPERED SWEPTBACK WINGS WITH STREAMWISE TIPS. SUPERSONIC LEADING AND TRAILING EDGES. John C. Martin and Isabella Jeffreys. July 1952. 143p. diags., 6 tabs. (NACA TN 2643)

THE THEORETICAL CHARACTERISTICS OF TRIANGULAR-TIP CONTROL SURFACES AT SUPERSONIC SPEEDS. MACH LINES BEHIND TRAILING EDGES. Julian H. Kainer and Mary Dowd King. July 1952. 76p. diags., 4 tabs. (NACA TN 2715)

EXPERIMENTAL INVESTIGATION OF THE LOCAL AND AVERAGE SKIN FRICTION IN THE LAMINAR BOUNDARY LAYER ON A FLAT PLATE AT A MACH NUMBER OF 2.4. Randall C. Maydew and Constantine C. Pappas. July 1952. 22p. diags. (NACA TN 2740)

BOUNDARY-LAYER DEVELOPMENT AND SKIN FRICTION AT MACH NUMBER 3.05. Paul F. Brinich and Nick S. Diaconis. July 1952. 49p. diags., photos. (NACA TN 2742)

PRACTICAL CALCULATION OF SECOND-ORDER SUPERSONIC FLOW PAST NONLIFTING BODIES OF REVOLUTION. Milton D. Van Dyke. July 1952. 62p. diags., 2 tabs., 2 charts. (NACA TN 2744)

USE OF FENCES TO INCREASE UNIFORMITY OF BOUNDARY LAYER ON SIDE WALLS OF SUPERSONIC WIND TUNNELS. Rudolph C. Haefeli. July 1952. 15p. diags., photos., tab. (NACA RM E52E19)

## AERODYNAMICS

### 12 FUNDAMENTAL (1.1)

#### *Supersonic Flow - Compressible (Cont.)*

ACCURACY OF APPROXIMATE METHODS FOR PREDICTING PRESSURES ON POINTED NONLIFTING BODIES OF REVOLUTION IN SUPERSONIC FLOW. Dorris M. Ehret. August 1952. 26p. diags. (NACA TN 2764)

SUPERSONIC FLOW WITH WHIRL AND VORTICITY IN AXISYMMETRIC CHANNELS. Ralph J. Eschborn. August 1952. 41p. diags. (NACA TN 2768)

STUDY OF THE PRESSURE RISE ACROSS SHOCK WAVES REQUIRED TO SEPARATE LAMINAR AND TURBULENT BOUNDARY LAYERS. Coleman duP. Donaldson and Roy H. Lange. September 1952. 20p. diags., photos., tab. (NACA TN 2770. Formerly RM L52C21)

AN APPROXIMATE METHOD FOR DETERMINING THE DISPLACEMENT EFFECTS AND VISCOUS DRAG OF LAMINAR BOUNDARY LAYERS IN TWO-DIMENSIONAL HYPERSONIC FLOW. Mitchel H. Bertram. September 1952. 41p. diags., photos., tab. (NACA TN 2773)

AIRFOIL PROFILES FOR MINIMUM PRESSURE DRAG AT SUPERSONIC VELOCITIES - APPLICATION OF SHOCK-EXPANSION THEORY, INCLUDING CONSIDERATION OF HYPERSOUND RANGE. Dean R. Chapman. September 1952. 44p. diags. (NACA TN 2787)

ON THE CALCULATION OF FLOW ABOUT OBJECTS TRAVELING AT HIGH SUPERSONIC SPEEDS. A. J. Eggers, Jr. October 1952. 25p. diags. (NACA TN 2811)

EFFECT OF A FINITE TRAILING-EDGE THICKNESS ON THE DRAG OF RECTANGULAR AND DELTA WINGS AT SUPERSONIC SPEEDS. E. B. Klunker and Conrad Rennemann, Jr. November 1952. 26p. diags. (NACA TN 2828)

CORRECTIONS FOR DRAG, LIFT, AND MOMENT OF AN AXIALLY SYMMETRICAL BODY PLACED IN A SUPERSONIC TUNNEL HAVING A TWO-DIMENSIONAL PRESSURE GRADIENT. I. J. Kolodner, F. Reiche and H. F. Ludloff, New York University. November 1952. 45p. (NACA TN 2837)

SPAN LOAD DISTRIBUTIONS RESULTING FROM CONSTANT ANGLE OF ATTACK, STEADY ROLLING VELOCITY, STEADY PITCHING VELOCITY, AND CONSTANT VERTICAL ACCELERATION FOR TAPERED SWEEPBACK WINGS WITH STREAMWISE TIPS. SUBSONIC LEADING EDGES AND SUPERSONIC TRAILING EDGES. Margery E. Hannah and Kenneth Margolis. December 1952. 221p. diags., 4 tabs. (NACA TN 2831)

CORRECTIONS FOR LIFT, DRAG, AND MOMENT OF AN AIRFOIL IN A SUPERSONIC TUNNEL HAVING A GIVEN STATIC PRESSURE GRADIENT. H. F. Ludloff and M. B. Friedman, New York University. December 1952. 69p. diags. (NACA TN 2849)

SUPERSONIC WAVE DRAG OF NONLIFTING DELTA WINGS WITH LINEARLY VARYING THICKNESS RATIO. Arthur Henderson, Jr. December 1952. 51p. diags. (NACA TN 2858)

INTERACTION BETWEEN A SUPERSONIC STREAM AND A PARALLEL SUBSONIC STREAM BOUNDED BY FLUID AT REST. Herbert S. Ribner and E. Leonard Arnoff. December 1952. 45p. diags., 2 tabs. (NACA TN 2860)

CONVECTION OF A PATTERN OF VORTICITY THROUGH A SHOCK WAVE. H. S. Ribner. January 1953. ii, 48p. diags. (NACA TN 2864)

REFLECTION OF A WEAK SHOCK WAVE FROM A BOUNDARY LAYER ALONG A FLAT PLATE. I - INTERACTION OF WEAK SHOCK WAVES WITH LAMINAR AND TURBULENT BOUNDARY LAYERS ANALYZED BY MOMENTUM-INTEGRAL METHOD. Alfred Ritter and Yung-Huai Kuo, Cornell University. January 1953. 66p. diags., tab. (NACA TN 2868)

REFLECTION OF WEAK SHOCK WAVE FROM A BOUNDARY LAYER ALONG A FLAT PLATE. II - INTERACTION OF OBLIQUE SHOCK WAVE WITH A LAMINAR BOUNDARY LAYER ANALYZED BY DIFFERENTIAL-EQUATION METHOD. Yung-Huai Kuo, Cornell University. January 1953. 60p. diags. (NACA TN 2869)

EXPERIMENTAL INVESTIGATION OF LOSS IN AN ANNULAR CASCADE OF TURBINE-NOZZLE BLADES OF FREE VORTEX DESIGN. Hubert W. Allen, Milton G. Kofskey and Richard E. Chamness. January 1953. 33p. diags., photos., tab. (NACA TN 2871)

FACTORS AFFECTING LAMINAR BOUNDARY LAYER MEASUREMENTS IN A SUPERSONIC STREAM. Robert E. Blue and George M. Low. Appendix B: REDUCTION OF DATA. Jack M. Lande. February 1953. 49p. diags. (NACA TN 2891)

A RAPID METHOD FOR ESTIMATING THE SEPARATION POINT OF A COMPRESSIBLE LAMINAR BOUNDARY LAYER. Laurence K. Loftin, Jr. and Homer B. Wilson, Jr. February 1953. 19p. diags. (NACA TN 2892)

EFFECT OF VARIABLE VISCOSITY AND THERMAL CONDUCTIVITY ON HIGH-SPEED SLIP FLOW BETWEEN CONCENTRIC CYLINDERS. T. C. Lin and R. E. Street, University of Washington. February 1953. 122p. diags. (NACA TN 2895)

THEORETICAL CALCULATION OF THE PRESSURE DISTRIBUTION, SPAN LOADING, AND ROLLING MOMENT DUE TO SIDESLIP AT SUPERSONIC SPEEDS FOR THIN SWEEPBACK TAPERED WINGS WITH SUPERSONIC TRAILING EDGES AND WING TIPS PARALLEL TO THE AXIS OF WING SYMMETRY. Kenneth Margolis, Windsor L. Sherman and Margery E. Hannah. February 1953. 70p. diags., tab. (NACA TN 2898)

STUDY OF SECONDARY-FLOW PATTERNS IN AN ANNULAR CASCADE OF TURBINE NOZZLE BLADES WITH VORTEX DESIGN. Harold E. Rohlik, Hubert W. Allen and Howard Z. Herzig. March 1953. 29p. diags., photos. (NACA TN 2909)

EFFECT OF THERMAL PROPERTIES ON LAMINAR-BOUNDARY-LAYER CHARACTERISTICS. E. B. Klunker and F. Edward McLean. March 1953. 29p. diags. (NACA TN 2916)

THE ZERO-LIFT DRAG OF A SLENDER BODY OF REVOLUTION (NACA RM-10 RESEARCH MODEL) AS DETERMINED FROM TESTS IN SEVERAL WIND TUNNELS AND IN FLIGHT AT SUPERSONIC SPEEDS. Albert J. Evans. April 1953. 40p. diags., tab. (NACA TN 2944)

*Supersonic Flow - Compressible (Cont.)*

A NEW SHADOWGRAPH TECHNIQUE FOR OBSERVATION OF CONICAL FLOW PHENOMENA IN SUPERSONIC FLOW AND PRELIMINARY RESULTS OBTAINED FOR A TRIANGULAR WING. Eugene S. Love and Carl E. Grigsby. May 1953. 16p. diags., photos. (NACA TN 2950)

## VISCOUS FLOW

### (1.1.3)

ESTIMATION OF THE FORCES AND MOMENTS ACTING ON INCLINED BODIES OF REVOLUTION OF HIGH FINENESS RATIO. H. Julian Allen. November 14, 1949. 27p. diags. (NACA RM A9I26) (Declassified from Restricted, 6/11/53)

EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF VISCOSITY ON THE DRAG AND BASE PRESSURE OF BODIES OF REVOLUTION AT A MACH NUMBER OF 1.5. Dean R. Chapman and Edward W. Perkins. 1951. ii, 24p. photos., diags. (NACA Rept. 1036. Formerly NACA RM A7A31a)

A STUDY OF EFFECTS OF VISCOSITY ON FLOW OVER SLENDER INCLINED BODIES OF REVOLUTION. H. Julian Allen and Edward W. Perkins. 1951. ii, 13p. diags., photos. (NACA Rept. 1048. Formerly TN 2044)

COMPARISON OF THEORETICAL AND EXPERIMENTAL HEAT-TRANSFER CHARACTERISTICS OF BODIES OF REVOLUTION AT SUPERSONIC SPEEDS. Richard Scherrer. 1951. ii, 15p. diags., photo. (NACA Rept. 1055. Formerly RM A8L28; TN 1975; TN 2087; TN 2131; TN 2148)

FLOW SEPARATION AHEAD OF BLUNT BODIES AT SUPERSONIC SPEEDS. W. E. Moeckel. July 1951. 39p. diags., photos. (NACA TN 2418)

INFLUENCE OF REFRACTION ON THE APPLICABILITY OF THE ZEHNDER-MACH INTERFEROMETER TO STUDIES OF COOLED BOUNDARY LAYERS. Martin R. Kinsler. September 1951. 39p. diags., tab. (NACA TN 2462)

EXPERIMENTAL INVESTIGATION OF THE PRESSURE DISTRIBUTION ABOUT A YAWED CIRCULAR CYLINDER IN THE CRITICAL REYNOLDS NUMBER RANGE. William J. Bursnall and Laurence K. Loftin, Jr. September 1951. 34p. diags. (NACA TN 2463)

UNSTEADY LAMINAR BOUNDARY-LAYER FLOW. Franklin K. Moore. September 1951. 33p. diags., 2 tabs. (NACA TN 2471)

BEHAVIOR OF FAST MOVING FLOW OF COMPRESSIBLE GAS IN CYLINDRICAL PIPE IN PRESENCE OF COOLING. (K Voprosu o Povedenii Bystrodvizhushchegosya Potoka Szhimayemogo Gaza v Pryamoi Tsilindricheskoj Trube pri Nalichii Okhlazhdeniya). G. A. Varshavsky. September 1951. 8p. diags. (NACA TM 1274. Trans. from Zhurnal Tekhnicheskoi Fiziki, v.16, no.4, 1946, p.413-416).

RESISTANCE OF A PLATE IN PARALLEL FLOW AT LOW REYNOLDS NUMBERS. (Odpor podélné obtékané desky při malých Reynoldsových číslech). Zbynek Janour. November 1951. 40p. diags., tab. (NACA TM 1316. Trans. from Letecký Vyzkumný Ústav, Praha, Rept. 2, 1947)

EFFECT OF SLIP ON FLOW NEAR A STAGNATION POINT AND IN A BOUNDARY LAYER. T. C. Lin and S. A. Schaaf, University of California. December 1951. 28p. diags. (NACA TN 2568)

GENERALIZATION OF BOUNDARY-LAYER MOMENTUM-INTEGRAL EQUATIONS TO THREE-DIMENSIONAL FLOWS INCLUDING THOSE OF ROTATING SYSTEM. Artur Mager. 1952. ii, 16p. diags. (NACA Rept. 1067. Formerly TN 2310).

DISCUSSION OF BOUNDARY-LAYER CHARACTERISTICS NEAR THE WALL OF AN AXIAL-FLOW COMPRESSOR. Artur Mager, John J. Mahoney and Ray E. Budinger. 1952. ii, 20p. diags., photo., tab. (NACA Rept. 1085. Formerly RM E51H07)

ON REFLECTION OF SHOCK WAVES FROM BOUNDARY LAYERS. H. W. Liepmann, A. Roshko and S. Dhawan, California Institute of Technology. 1952. ii, 29p. diags., photos., tab. (NACA Rept. 1100. Formerly TN 2334)

DIRECT MEASUREMENTS OF SKIN FRICTION. Satish Dhawan, California Institute of Technology. January 1952. 60p. diags., photos. (NACA TN 2567)

LAMINAR BOUNDARY LAYER OVER FLAT PLATE IN A FLOW HAVING CIRCULAR STREAMLINES. Artur Mager and Arthur G. Hansen. March 1952. 28p. diags., tab. (NACA TN 2658)

ELECTRICAL TECHNIQUES FOR COMPENSATION OF THERMAL TIME LAG OF THERMOCOUPLES AND RESISTANCE THERMOMETER ELEMENTS. Charles E. Shepard and Isidore Warshawsky. May 1952. ii, 85p. diags., photos., 9 tabs. (NACA TN 2703)

DISPLACEMENT EFFECT OF A THREE-DIMENSIONAL BOUNDARY LAYER. Franklin K. Moore. June 1952. 15p. diags. (NACA TN 2722)

INTERACTION OF OBLIQUE SHOCK WAVES WITH REGIONS OF VARIABLE PRESSURE, ENTROPY, AND ENERGY. W. E. Moeckel. June 1952. 34p. diags. (NACA TN 2725)

THE EFFECT OF HIGH VISCOSITY ON THE FLOW AROUND A CYLINDER AND AROUND A SPHERE. (Der Einfluss grosser Zähigkeit bei der Strömung um den Zylinder und um die Kugel). F. Homann. June 1952. 29p. diags., tab. (NACA TM 1334. Trans. from Zeitschrift für angewandte Mathematik und Mechanik, v. 16, no. 3, June 1936, p. 153-164).

BOUNDARY-LAYER DEVELOPMENT AND SKIN FRICTION AT MACH NUMBER 3.05. Paul F. Brinich and Nick S. Diaconis. July 1952. 49p. diags., photos. (NACA TN 2742)

EFFECTS OF MACH NUMBER VARIATION BETWEEN 0.07 AND 0.34 AND REYNOLDS NUMBER VARIATION BETWEEN  $0.97 \times 10^6$  AND  $8.10 \times 10^6$  ON THE MAXIMUM LIFT COEFFICIENT OF A WING OF NACA 64-210 AIRFOIL SECTIONS. James E. Fitzpatrick and William C. Schneider. August 1952. 34p. diags., photos., tab. (NACA TN 2753)

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*Viscous Flow (Cont.)*

AN APPROXIMATE METHOD FOR DETERMINING THE DISPLACEMENT EFFECTS AND VISCOUS DRAG OF LAMINAR BOUNDARY LAYERS IN TWO-DIMENSIONAL HYPERSONIC FLOW. Mitchel H. Bertram. September 1952. 41p. diagrs., photos., tab. (NACA TN 2773)

EFFECT OF GEOMETRY ON SECONDARY FLOWS IN BLADE ROWS. A. G. Hansen, G. R. Costello and H. Z. Herzig. October 1952. 38p. photos. (NACA RM E52H26)

SPIRAL MOTIONS OF VISCOUS FLUIDS. (Spiralförmige Bewegungen zäher Flüssigkeiten). Georg Hamel. January 1953. 44p. (NACA TM 1342. Trans. from Deutsche Mathematiker-vereinigung, Jahresbericht, v. 25, 1917, p. 34-60).

EFFECT OF VARIABLE VISCOSITY AND THERMAL CONDUCTIVITY ON HIGH-SPEED SLIP FLOW BETWEEN CONCENTRIC CYLINDERS. T. C. Lin and R. E. Street, University of Washington. February 1953. 122p. diagrs. (NACA TN 2895)

ON THE DEVELOPMENT OF TURBULENT WAKES FROM VORTEX STREETS. Anatol Roshko, California Institute of Technology. March 1953. 77p. diagrs., photos., 3 tabs. (NACA TN 2913)

SMOKE STUDIES OF SECONDARY FLOWS IN BENDS, TANDEM CASCADES, AND HIGH-TURNING CONFIGURATIONS. Arthur G. Hansen, Howard Z. Herzig and George R. Costello. March 1953. 33p. photos., diagr. (NACA RM E52L24a)

A VISUALIZATION STUDY OF SECONDARY FLOWS IN CASCADES. Arthur G. Hansen, Howard Z. Herzig and George R. Costello. May 1953. 93p. photos., diagrs. (NACA TN 2947. Formerly RM E52F19)

LAMINAR FLOW  
(1.1.3.1)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

EXPERIMENTAL AND THEORETICAL STUDIES OF AREA SUCTION FOR THE CONTROL OF THE LAMINAR BOUNDARY LAYER ON AN NACA 64A010 AIRFOIL. Albert L. Braslow, Dale L. Burrows, Neal Tetervin and Fioravante Visconti. 1951. ii, 19p. diagrs., photos. (NACA Rept. 1025. Formerly TN 1905; TN 2112)

ON STABILITY AND TURBULENCE OF FLUID FLOWS. (Über Stabilität und Turbulenz von Flüssigkeitsströmen). Werner Heisenberg. June 1951. 60p. diagrs. (NACA TM 1291. Trans. from Annalen der Physik, v. 74, no. 15, 1924, p. 577-627).

APPLICATION OF X-RAY ABSORPTION TO MEASUREMENT OF SMALL AIR-DENSITY GRADIENTS. Ruth N. Weltmann, Steven Fairweather and Daryl Papke. July 1951. 41p. diagrs., photos. (NACA TN 2406)

ANALYTICAL INVESTIGATION OF FULLY DEVELOPED LAMINAR FLOW IN TUBES WITH HEAT TRANSFER WITH FLUID PROPERTIES VARIABLE ALONG THE RADIUS. Robert G. Deissler. July 1951. 28p. diagrs. (NACA TN 2410)

APPROXIMATE METHOD OF INTEGRATION OF LAMINAR BOUNDARY LAYER IN INCOMPRESSIBLE FLUID. (Priblizhennyi Metod Integrirovaniya Uravnenii Laminarnogo Pogranichnogo Sloia v Neszhimaemom Gaze). L. G. Loitsianskii. July 1951. 21p. diagrs. (NACA TM 1293. Trans. from Prikladnaya Matematika i Mekhanika, v. 13, no. 5, Oct. 1949, p. 513-525).

THE FLOW OF GASES IN NARROW CHANNELS. (Über die Strömung von Gasen in engen Kanälen). R. E. H. Rasmussen. August 1951. 46p. diagrs., photo., 2 tabs. (NACA TM 1301. Trans. from Annalen der Physik, v. 29, ser. 5, no. 8, August 1937, p. 665-697)

TABLES OF EXACT LAMINAR-BOUNDARY-LAYER SOLUTIONS WHEN THE WALL IS POROUS AND FLUID PROPERTIES ARE VARIABLE. W. Byron Brown and Patrick L. Donoughe. September 1951. 68p. diagrs., 2 tabs. (NACA TN 2479)

LAMINAR FRICTION AND HEAT TRANSFER AT MACH NUMBERS FROM 1 TO 10. E. B. Klunker and F. Edward McLean. October 1951. 22p. diagrs. (NACA TN 2499)

LAMINAR BOUNDARY LAYER ON A CIRCULAR CONE IN SUPERSONIC FLOW AT A SMALL ANGLE OF ATTACK. Franklin K. Moore. October 1951. 44p. diagrs., tab. (NACA TN 2521)

SIMPLIFIED METHOD FOR CALCULATION OF COMPRESSIBLE LAMINAR BOUNDARY LAYER WITH ARBITRARY FREE-STREAM PRESSURE GRADIENT. George M. Low. October 1951. 28p. diagrs., 2 tabs. (NACA TN 2531)

DISPLACEMENT EFFECT OF THE LAMINAR BOUNDARY LAYER AND THE PRESSURE DRAG. (Verdrängungswirkung der laminaren Grenzschichten und Druckwiderstand). H. Görtler. October 1951. 43p. diagrs., 3 tabs. (NACA TM 1315. Trans. from Ingenieur-Archiv, v. 14, 1944, p. 286-305).

ON MOTION OF FLUID IN BOUNDARY LAYER NEAR LINE OF INTERSECTION OF TWO PLANES. (O Dvizhenii Zhidkosti v Pogranichnom Sloe Vbliizi Linii Peresechenia Dvukh Ploskostei). L. G. Loitsianskii and V. P. Bolshakov. November 1951. 27p. diagrs., 4 tabs. (NACA TM 1308. Trans. from Central Aero-Hydrodynamical Institute, Transactions, Rept. 279, 1936, p. 3-18).

RESISTANCE OF A PLATE IN PARALLEL FLOW AT LOW REYNOLDS NUMBERS. (Odpor podélně obtékané desky při malých Reynoldsových číslech). Zbynek Janour. November 1951. 40p. diagrs., tab. (NACA TM 1316. Trans. from Letecký Vyzkumný Ústav, Praha, Rept. 2, 1947)

ON REFLECTION OF SHOCK WAVES FROM BOUNDARY LAYERS. H. W. Liepmann, A. Roshko and S. Dhawan, California Institute of Technology. 1952. ii, 29p. diagrs., photos., tab. (NACA Rept. 1100. Formerly TN 2334)

INVESTIGATION OF LAMINAR BOUNDARY LAYER IN COMPRESSIBLE FLUIDS USING THE CROCCO METHOD. E. R. Van Driest, North American Aviation, Inc. January 1952. 78p. diagrs., 3 tabs. (NACA TN 2597)

*Laminar Flow - Viscous (Cont.)*

ESTIMATE OF SLIP EFFECT ON COMPRESSIBLE LAMINAR-BOUNDARY-LAYER SKIN FRICTION. Harold Mirels. January 1952. 22p. diags. (NACA TN 2609)

AN ANALYSIS OF LAMINAR FREE-CONVECTION FLOW AND HEAT TRANSFER ABOUT A FLAT PLATE PARALLEL TO THE DIRECTION OF THE GENERATING BODY FORCE. Simon Ostrach. February 1952. 47p. diags., tab. (NACA TN 2635)

CRITICAL STUDY OF INTEGRAL METHODS IN COMPRESSIBLE LAMINAR BOUNDARY LAYERS. Paul A. Libby, Morris Morduchow and Martin Bloom, Polytechnic Institute of Brooklyn. March 1952. 40p. diags., 3 tabs. (NACA TN 2655)

LAMINAR BOUNDARY LAYER OVER FLAT PLATE IN A FLOW HAVING CIRCULAR STREAMLINES. Artur Mager and Arthur G. Hansen. March 1952. 28p. diags., tab. (NACA TN 2658)

DEVELOPMENT OF A LAMINAR BOUNDARY LAYER LAYER BEHIND A SUCTION POINT. (Entwicklung einer laminaren Grenzschicht hinter einer absaugestelle). W. Wuest. March 1952. 18p. diags. (NACA TM 1336. Trans. from Ingenieur-Archiv, v. 17, 1949, p.199-206).

EXPERIMENTAL INVESTIGATION OF AN NACA 64A010 AIRFOIL SECTION WITH 41 SUCTION SLOTS ON EACH SURFACE FOR CONTROL OF LAMINAR BOUNDARY LAYER. Dale L. Burrows and Milton A. Schwartzberg. April 1952. 37p. diags., photos. (NACA TN 2644)

EXPERIMENTAL INVESTIGATION OF HEAT TRANSFER THROUGH LAMINAR AND TURBULENT BOUNDARY LAYERS ON A COOLED FLAT PLATE AT A MACH NUMBER OF 2.4. Ellis G. Slack. April 1952. 31p. diags. (NACA TN 2686)

A SIMPLE NUMERICAL METHOD FOR THE CALCULATION OF THE LAMINAR BOUNDARY LAYER. (Ein einfaches numerisches Verfahren zur Berechnung der laminaren Grenzschicht). K. Schröder. April 1952. 47p. diags., 3 tabs. (NACA TM 1317. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1714; Deutsche Versuchsanstalt für Luftfahrt E. V., Berlin. Institut für Aerodynamik, February 25, 1943.)

USE OF THE BOUNDARY LAYER OF A CONE TO MEASURE SUPERSONIC FLOW INCLINATION. Franklin K. Moore. June 1952. 21p. diags. (NACA TN 2723)

EXPERIMENTAL INVESTIGATION OF THE LOCAL AND AVERAGE SKIN FRICTION IN THE LAMINAR BOUNDARY LAYER ON A FLAT PLATE AT A MACH NUMBER OF 2.4. Randall C. Maydew and Constantine C. Pappas. July 1952. 22p. diags. (NACA TN 2740)

A STUDY OF THE STABILITY OF THE LAMINAR BOUNDARY LAYER AS AFFECTED BY CHANGES IN THE BOUNDARY-LAYER THICKNESS IN REGIONS OF PRESSURE GRADIENT AND FLOW THROUGH THE SURFACE. Neal Tetervin and David A. Levine. August 1952. 83p. diags., tab. (NACA TN 2752)

A FLIGHT INVESTIGATION OF THE EFFECT OF SHAPE AND THICKNESS OF THE BOUNDARY LAYER ON THE PRESSURE DISTRIBUTION IN THE PRESENCE OF SHOCK. Eziaslav N. Harrin. September 1952. 13p. diags., photos. (NACA TN 2765)

STUDY OF THE PRESSURE RISE ACROSS SHOCK WAVES REQUIRED TO SEPARATE LAMINAR AND TURBULENT BOUNDARY LAYERS. Coleman duP. Donaldson and Roy H. Lange. September 1952. 20p. diags., photos., tab. (NACA TN 2770. Formerly RM L52C21)

AN APPROXIMATE METHOD FOR DETERMINING THE DISPLACEMENT EFFECTS AND VISCOUS DRAG OF LAMINAR BOUNDARY LAYERS IN TWO-DIMENSIONAL HYPERSONIC FLOW. Mitchel H. Bertram. September 1952. 41p. diags., photos., tab. (NACA TN 2773)

METHOD FOR CALCULATION OF COMPRESSIBLE LAMINAR BOUNDARY-LAYER CHARACTERISTICS IN AXIAL PRESSURE GRADIENT WITH ZERO HEAT TRANSFER. Morris Morduchow and Joseph H. Clarke, Polytechnic Institute of Brooklyn. September 1952. 43p. diags., 4 tabs. (NACA TN 2784)

SOLUTIONS OF LAMINAR-BOUNDARY-LAYER EQUATIONS WHICH RESULT IN SPECIFIC-WEIGHT-FLOW PROFILES LOCALLY EXCEEDING FREE-STREAM VALUES. W. Byron Brown and John N. B. Livingood. September 1952. 36p. diags., 2 tabs. (NACA TN 2800)

THE EXCITATION OF UNSTABLE PERTURBATIONS IN A LAMINAR FRICTION LAYER. (Die Anfachung instabiler Störungen in einer laminaren Reibungsschicht). J. Pretsch. September 1952. 63p. diags., 3 tabs. (NACA TM 1343. Trans. from Aerodynamische Versuchsanstalt Göttingen E. V., Institut für Forschungsflugbetrieb und Flugwesen; Jahrbuch der deutschen Luftfahrtforschung, August 1942, p. I 54-71).

TRANSITION CAUSED BY THE LAMINAR FLOW SEPARATION. (Sōryu-Hakuri ni tomonau Sen'i ni kansuru Kenkyū). T. Maekawa and S. Atsumi. September 1952. 14p. diags., 2 tabs. (NACA TM 1352. Trans. from Society of Applied Mechanics of Japan, Journal, v. 1, no. 6, November 1948, p. 187-192)

EXPERIMENTAL STUDY OF THE EFFECTS OF FINITE SURFACE DISTURBANCES AND ANGLE OF ATTACK ON THE LAMINAR BOUNDARY LAYER ON AN NACA 64A010 AIRFOIL WITH AREA SUCTION. Milton A. Schwartzberg and Albert L. Braslow. October 1952. 35p. diags. (NACA TN 2796)

INVESTIGATION WITH AN INTERFEROMETER OF THE FLOW AROUND A CIRCULAR-ARC AIRFOIL AT MACH NUMBERS BETWEEN 0.6 AND 0.9. George P. Wood and Paul B. Gooderum. October 1952. 80p. diags., photos., tab. (NACA TN 2801)

ON THE DESIGN OF AIRFOILS IN WHICH THE TRANSITION OF THE BOUNDARY LAYER IS DELAYED. (Kyōkaiiso no Sen'i o okuraseru Yokugata no tuite). Itiro Tani. October 1952. 74p. diags., 8 tabs. (NACA TM 1351. Trans. from Aeronautical Research Institute, Tokyo Imperial Univ., Rept. 250, v. 19, no. 1, January 1943).



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#### *Laminar Flow - Viscous (Cont.)*

SECOND APPROXIMATION TO LAMINAR COMPRESSIBLE BOUNDARY LAYER ON FLAT PLATE IN SLIP FLOW. Stephen H. Maslen. November 1952. 38p. diagrs., tab. (NACA TN 2818)

EXPERIMENTS ON TRANSONIC FLOW AROUND WEDGES. George P. Wood. November 1952. 34p. diagrs., photos., tab. (NACA TN 2829)

LAMINAR BOUNDARY LAYER ON CONE IN SUPERSONIC FLOW AT LARGE ANGLE OF ATTACK. Franklin K. Moore. Appendix B: NUMERICAL SOLUTION OF DIFFERENTIAL EQUATIONS. Lynn Albers. November 1952. 34p. diagrs. (NACA TN 2844)

X-RAY INSTRUMENTATION FOR DENSITY MEASUREMENTS IN A SUPERSONIC FLOW FIELD. John Dimeff, Ralph K. Hallett, Jr. and C. Frederick Hansen. December 1952. 39p. diagrs., photos., 2 tabs. (NACA TN 2845)

INTERACTION BETWEEN A SUPERSONIC STREAM AND A PARALLEL SUBSONIC STREAM BOUNDED BY FLUID AT REST. Herbert S. Ribner and E. Leonard Arnoff. December 1952. 45p. diagrs., 2 tabs. (NACA TN 2860)

LAMINAR NATURAL-CONVECTION FLOW AND HEAT TRANSFER OF FLUIDS WITH AND WITHOUT HEAT SOURCES IN CHANNELS WITH CONSTANT WALL TEMPERATURES. Simon Ostrach. December 1952. 55p. diagrs. (NACA TN 2863)

REFLECTION OF A WEAK SHOCK WAVE FROM A BOUNDARY LAYER ALONG A FLAT PLATE. I - INTERACTION OF WEAK SHOCK WAVES WITH LAMINAR AND TURBULENT BOUNDARY LAYERS ANALYZED BY MOMENTUM-INTEGRAL METHOD. Alfred Ritter and Yung-Huai Kuo, Cornell University. January 1953. 66p. diagrs., tab. (NACA TN 2868)

REFLECTION OF WEAK SHOCK WAVE FROM A BOUNDARY LAYER ALONG A FLAT PLATE. II - INTERACTION OF OBLIQUE SHOCK WAVE WITH A LAMINAR BOUNDARY LAYER ANALYZED BY DIFFERENTIAL-EQUATION METHOD. Yung-Huai Kuo, Cornell University. January 1953. 60p. diagrs. (NACA TN 2869)

SPIRAL MOTIONS OF VISCOUS FLUIDS. (Spiralförmige Bewegungen zäher Flüssigkeiten). Georg Hamel. January 1953. 44p. (NACA TM 1342. Trans. from Deutsche Mathematiker-vereinigung, Jahresbericht, v. 25, 1917, p. 34-60).

FACTORS AFFECTING LAMINAR BOUNDARY LAYER MEASUREMENTS IN A SUPERSONIC STREAM. Robert E. Blue and George M. Low. Appendix B: REDUCTION OF DATA. Jack M. Lande. February 1953. 49p. diagrs. (NACA TN 2891)

A RAPID METHOD FOR ESTIMATING THE SEPARATION POINT OF A COMPRESSIBLE LAMINAR BOUNDARY LAYER. Laurence K. Loftin, Jr. and Homer B. Wilson, Jr. February 1953. 19p. diagrs. (NACA TN 2892)

ON A CLASS OF EXACT SOLUTIONS OF THE EQUATIONS OF MOTION OF A VISCOUS FLUID. (Ob odnom klasse tochnykh reshenii uravnenii dvizheniya vyazkoi zhidkosti). V. I. Yatsyev. February 1953. 7p. (NACA TM 1349. Trans. from Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki, v. 20, no. 11, 1950, p. 1031-1034).

EFFECT OF THERMAL PROPERTIES ON LAMINAR-BOUNDARY-LAYER CHARACTERISTICS. E. B. Klunker and F. Edward McLean. March 1953. 29p. diagrs. (NACA TN 2916)

THE ZERO-LIFT DRAG OF A SLENDER BODY OF REVOLUTION (NACA RM-10 RESEARCH MODEL) AS DETERMINED FROM TESTS IN SEVERAL WIND TUNNELS AND IN FLIGHT AT SUPERSONIC SPEEDS. Albert J. Evans. April 1953. 40p. diagrs., tab. (NACA TN 2944)

PRESSURE DISTRIBUTIONS ABOUT FINITE WEDGES IN BOUNDED AND UNBOUNDED SUBSONIC STREAMS. Patrick L. Donoughe and Ernst I. Prasse. May 1953. 41p. diagrs., photos., 2 tabs. (NACA TN 2942)

#### TURBULENT FLOW (1.1.3.2)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

THE EFFECT OF THE INLET MACH NUMBER AND INLET-BOUNDARY-LAYER THICKNESS ON THE PERFORMANCE OF A 23° CONICAL-DIFFUSER - TAIL-PIPE COMBINATION. Jerome Persh. March 21, 1950. 53p. diagrs. (NACA RM L9K10) (Declassified from Restricted, 6/11/53)

INVESTIGATION OF HIGH-SUBSONIC PERFORMANCE CHARACTERISTICS OF A 12° 21-INCH CONICAL DIFFUSER, INCLUDING THE EFFECTS OF CHANGE IN INLET-BOUNDARY-LAYER THICKNESS. Martin R. Copp and Paul L. Klevatt. March 24, 1950. 51p. diagrs., photos. (NACA RM L9H10) (Declassified from Restricted, 6/11/53)

HIGH-SUBSONIC PERFORMANCE CHARACTERISTICS AND BOUNDARY-LAYER INVESTIGATIONS OF A 12° 10-INCH-INLET-DIAMETER CONICAL DIFFUSER. B. H. Little, Jr. and Stafford W. Wilbur. May 11, 1950. 62p. diagrs., photos. (NACA RM L50C02a) (Declassified from Restricted, 6/11/53)

INVESTIGATION OF SEPARATION OF THE TURBULENT BOUNDARY LAYER. G. B. Schubauer and P. S. Klebanoff, National Bureau of Standards. 1951. 20p. diagrs., photos., 8 tabs. (NACA Rept. 1030. Formerly TN 2133)

A GENERAL INTEGRAL FORM OF THE BOUNDARY-LAYER EQUATION FOR INCOMPRESSIBLE FLOW WITH AN APPLICATION TO THE CALCULATION OF THE SEPARATION POINT OF TURBULENT BOUNDARY LAYERS. Neal Tetervin and Chia Chiao Lin. 1951. 19p. diagrs. (NACA Rept. 1046. Formerly TN 2158)

*Turbulent Flow - Viscous (Cont.)*

INVESTIGATION OF TURBULENT FLOW IN A TWO-DIMENSIONAL CHANNEL. John Laufer, California Institute of Technology. 1951. 20p. diags., photos. (NACA Rept. 1053. Formerly TN 2123)

ON STABILITY AND TURBULENCE OF FLUID FLOWS. (Über Stabilität und Turbulenz von Flüssigkeitsströmen). Werner Heisenberg. June 1951. 60p. diags. (NACA TM 1291. Trans. from Annalen der Physik, v.74, no.15, 1924, p.577-627).

SKIN FRICTION OF INCOMPRESSIBLE TURBULENT BOUNDARY LAYERS UNDER ADVERSE PRESSURE GRADIENTS. Fabio R. Goldschmied. August 1951. 65p. diags. (NACA TN 2431)

ON THE RECORDING OF TURBULENT LONGITUDINAL AND TRANSVERSE FLUCTUATIONS. (Über das Messen turbulenter Längs- und Querschwingungen). H. Reichardt. August 1951. 10p. diags. (NACA TM 1313. Trans. from Zeitschrift für angewandte Mathematik und Mechanik, v. 18, no. 6, December 1938, p.358-361).

A GENERAL CORRELATION OF TEMPERATURE PROFILES DOWNSTREAM OF A HEATED AIR JET DIRECTED PERPENDICULARLY TO AN AIR STREAM. Edmund E. Callaghan and Robert S. Ruggeri. September 1951. 37p. diags. (NACA TN 2466)

A PROCEDURE FOR CALCULATING THE DEVELOPMENT OF TURBULENT BOUNDARY LAYERS UNDER THE INFLUENCE OF ADVERSE PRESSURE GRADIENTS. Kennedy F. Rubert and Jerome Persh. September 1951. 61p. diags. (NACA TN 2478)

A COMPARISON OF THE TURBULENT BOUNDARY-LAYER GROWTH ON AN UNSWEPT AND A SWEEPED WING. John M. Altman and Nora-Lee F. Hayter. September 1951. 30p. diags., photos. (NACA TN 2500)

SCHLIEREN INVESTIGATION OF THE WING SHOCK-WAVE BOUNDARY-LAYER INTERACTION IN FLIGHT. George E. Cooper and Richard S. Bray. September 1951. 26p. diags., photos. (NACA RM A51G09)

SOME FEATURES OF ARTIFICIALLY THICKENED FULLY DEVELOPED TURBULENT BOUNDARY LAYERS WITH ZERO PRESSURE GRADIENT. P. S. Klebanoff and Z. W. Diehl, National Bureau of Standards. October 1951. 55p. diags., photos. (NACA TN 2475)

ON THE TURBULENT FRICTION LAYER FOR RISING PRESSURE. (Zur turbulenten reibungsschicht bei druckanstieg). K. Wieghardt and W. Tillmann. October 1951. 46p. diags. (NACA TM 1314. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. UM 6617, November 20, 1944).

ON THE SPECTRUM OF ISOTROPIC TURBULENCE. H. W. Liepmann, J. Laufer and Kate Liepmann, California Institute of Technology. November 1951. 61p. diags. (NACA TN 2473)

STUDIES OF VON KÁRMÁN'S SIMILARITY THEORY AND ITS EXTENSION TO COMPRESSIBLE FLOWS. A CRITICAL EXAMINATION OF SIMILARITY THEORY FOR INCOMPRESSIBLE FLOWS. C. C. Lin and S. F. Shen, Massachusetts Institute of Technology. November 1951. 24p. (NACA TN 2541)

STUDIES OF VON KÁRMÁN'S SIMILARITY THEORY AND ITS EXTENSION TO COMPRESSIBLE FLOWS. A SIMILARITY THEORY FOR TURBULENT BOUNDARY LAYER OVER A FLAT PLATE IN COMPRESSIBLE FLOW. C. C. Lin and S. F. Shen, Massachusetts Institute of Technology. November 1951. 37p. (NACA TN 2542)

STUDIES OF VON KARMAN'S SIMILARITY THEORY AND ITS EXTENSION TO COMPRESSIBLE FLOWS. INVESTIGATION OF TURBULENT BOUNDARY LAYER OVER A FLAT PLATE IN COMPRESSIBLE FLOW BY THE SIMILARITY THEORY. S. F. Shen, Massachusetts Institute of Technology. November 1951. 43p. (NACA TN 2543)

ON MOTION OF FLUID IN BOUNDARY LAYER NEAR LINE OF INTERSECTION OF TWO PLANES. (O Dvizhenii Zhidkosti v Pogranichnom Sloe Vblizi Linii Peresechenia Dvukh Ploskostel). L. G. Loitsianskii and V. P. Bolshakov. November 1951. 27p. diags., 4 tabs. (NACA TM 1308. Trans. from Central Aero-Hydrodynamical Institute, Transactions, Rept.279, 1936, p.3-18).

CONTRIBUTIONS TO THE THEORY OF THE SPREADING OF A FREE JET ISSUING FROM A NOZZLE. (Zur Theorie der Ausbreitung eines aus einer Düse austretenden freien Strahls). W. Szablewski. November 1951. 72p. diags. (NACA TM 1311. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. UM 8003, September 1944).

APPLICATION OF THE VON KÁRMÁN MOMENTUM THEOREM TO TURBULENT BOUNDARY LAYERS. Jerold M. Bidwell. December 1951. 25p. diags. (NACA TN 2571)

ON REFLECTION OF SHOCK WAVES FROM BOUNDARY LAYERS. H. W. Liepmann, A. Roshko and S. Dhawan, California Institute of Technology. 1952. ii, 29p. diags., photos., tab. (NACA Rept. 1100. Formerly TN 2334)

SPECTRUM OF TURBULENCE IN A CONTRACTING STREAM. H. S. Ribner and M. Tucker. January 1952. 54p. diags., tab. (NACA TN 2606)

ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF FULLY DEVELOPED TURBULENT FLOW OF AIR IN A SMOOTH TUBE WITH HEAT TRANSFER WITH VARIABLE FLUID PROPERTIES. R. G. Deissler and C. S. Eian. February 1952. 43p. diags. (NACA TN 2629)

EXPERIMENTAL INVESTIGATION OF THE TURBULENT-BOUNDARY-LAYER TEMPERATURE-RECOVERY FACTOR ON BODIES OF REVOLUTION AT MACH NUMBERS FROM 2.0 TO 3.8. Howard A. Stine and Richard Scherrer. March 1952. 20p. diags. (NACA TN 2664)

EXPERIMENTAL INVESTIGATION OF HEAT TRANSFER THROUGH LAMINAR AND TURBULENT BOUNDARY LAYERS ON A COOLED FLAT PLATE AT A MACH NUMBER OF 2.4. Ellis G. Slack. April 1952. 31p. diags. (NACA TN 2686)

ON THE FORM OF THE TURBULENT SKIN-FRICTION LAW AND ITS EXTENSION TO COMPRESSIBLE FLOWS. Coleman duP. Donaldson. May 1952. 19p. diags. (NACA TN 2692)

**AERODYNAMICS**  
**18 FUNDAMENTAL (1.1)**

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*Turbulent Flow - Viscous (Cont.)*

DIFFUSION OF HEAT FROM A LINE SOURCE IN ISOTROPIC TURBULENCE. Mahinder S. Uberoi and Stanley Corrsin, Johns Hopkins University. June 1952. 90p. diagrs., photos., tab. (NACA TN 2710)

PRELIMINARY SURVEY OF BOUNDARY-LAYER DEVELOPMENT AT A NOMINAL MACH NUMBER OF 5.5. Harold L. Bloom. June 1952. 26p. diagrs., photos. (NACA RM E52D03)

SOME EXPERIENCES REGARDING THE NONLINEARITY OF HOT WIRES. (Quelques expériences sur la non-linéarité des fils chauds). R. Betchov and W. Welling. June 1952. 13p. diagrs. (NACA TM 1223. Trans. from Koninklijke Nederlandsche Akademie van Wetenschappen te Amsterdam, Verhandelingen, v.53, no.4, 1950, p.432-439; Technische Hoogenschool te Delft, Laboratorium voor Aero- en Hydrodynamica. Mededeling 66).

NONLINEAR THEORY OF A HOT-WIRE ANEMOMETER. (Théorie non-linéaire de l'anémomètre à fil chaud). R. Betchov. July 1952. 23p. diagrs. (NACA TM 1346. Trans. from Koninklijke Nederlandsche Akademie van Wetenschappen te Amsterdam, Verhandelingen, v. 52, no. 3, 1949, p. 195-207; Technische Hoogenschool te Delft, Laboratorium voor Aero- en Hydrodynamica. Mededeeling 61).

ANALYSIS OF FULLY DEVELOPED TURBULENT HEAT TRANSFER AT LOW PECLET NUMBERS IN SMOOTH TUBES WITH APPLICATION TO LIQUID METALS. Robert G. Deissler. August 1952. 20p. diagrs. (NACA RM E52F05)

A FLIGHT INVESTIGATION OF THE EFFECT OF SHAPE AND THICKNESS OF THE BOUNDARY LAYER ON THE PRESSURE DISTRIBUTION IN THE PRESENCE OF SHOCK. Eziaslav N. Harrin. September 1952. 13p. diagrs., photos. (NACA TN 2765)

STUDY OF THE PRESSURE RISE ACROSS SHOCK WAVES REQUIRED TO SEPARATE LAMINAR AND TURBULENT BOUNDARY LAYERS. Coleman duP. Donaldson and Roy H. Lange. September 1952. 20p. diagrs., photos., tab. (NACA TN 2770. Formerly RM L52C21)

THE EXCITATION OF UNSTABLE PERTURBATIONS IN A LAMINAR FRICTION LAYER. (Die Anfängung instabiler Störungen in einer laminaren Reibungsschicht). J. Pretsch. September 1952. 63p. diagrs., 3 tabs. (NACA TM 1343. Trans. from Aerodynamische Versuchsanstalt Göttingen E. V., Institut für Forschungsfahrtbetrieb und Flugwesen; Jahrbuch der deutschen Luftfahrtforschung, August 1942, p.154-71).

TRANSITION CAUSED BY THE LAMINAR FLOW SEPARATION. (Sōryu-Hakuri ni tomonau Sen'i ni kansuru Kenkyū). T. Maekawa and S. Atsumi. September 1952. 14p. diagrs., 2 tabs. (NACA TM 1352. Trans. from Society of Applied Mechanics of Japan, Journal, v.1, no.6, November 1948, p.187-192)

INVESTIGATION WITH AN INTERFEROMETER OF THE FLOW AROUND A CIRCULAR-ARC AIRFOIL AT MACH NUMBERS BETWEEN 0.6 AND 0.9. George P. Wood and Paul B. Gooderum. October 1952. 80p. diagrs., photos., tab. (NACA TN 2801)

ON THE DESIGN OF AIRFOILS IN WHICH THE TRANSITION OF THE BOUNDARY LAYER IS DELAYED. (Kyōkai no Sen'i o okuraseru Yokugata no tuite). Itiro Tani. October 1952. 74p. diagrs., 8 tabs. (NACA TM 1351. Trans. from Aeronautical Research Institute, Tokyo Imperial Univ., Rept. 250, v. 19, no. 1, January 1943).

EXPERIMENTS ON TRANSONIC FLOW AROUND WEDGES. George P. Wood. November 1952. 34p. diagrs., photos., tab. (NACA TN 2829)

LAMINAR BOUNDARY LAYER ON CONE IN SUPERSONIC FLOW AT LARGE ANGLE OF ATTACK. Franklin K. Moore. Appendix B: NUMERICAL SOLUTION OF DIFFERENTIAL EQUATIONS. Lynn Albers. November 1952. 34p. diagrs. (NACA TN 2844)

AUXILIARY EQUIPMENT AND TECHNIQUES FOR ADAPTING THE CONSTANT-TEMPERATURE HOT-WIRE ANEMOMETER TO SPECIFIC PROBLEMS IN AIR-FLOW MEASUREMENTS. James C. Laurence and L. Gene Landes. December 1952. ii, 77p. diagrs., photos., 3 tabs. (NACA TN 2843)

GENERAL CORRELATION OF TEMPERATURE PROFILES DOWNSTREAM OF A HEATED AIR JET DIRECTED AT VARIOUS ANGLES TO AIR STREAM. Robert S. Ruggeri. December 1952. 59p. diagrs., tab. (NACA TN 2855)

INTERACTION BETWEEN A SUPERSONIC STREAM AND A PARALLEL SUBSONIC STREAM BOUNDED BY FLUID AT REST. Herbert S. Ribner and E. Leonard Arnoff. December 1952. 45p. diagrs., 2 tabs. (NACA TN 2860)

AVERAGE SKIN-FRICTION DRAG COEFFICIENTS FROM TANK TESTS OF A PARABOLIC BODY OF REVOLUTION (NACA RM-10). Elmo J. Mottard and J. Dan Loposer. January 1953. 18p. diagrs., photos. (NACA TN 2854)

CONVECTION OF A PATTERN OF VORTICITY THROUGH A SHOCK WAVE. H. S. Ribner. January 1953. ii, 48p. diagrs. (NACA TN 2864)

REFLECTION OF A WEAK SHOCK WAVE FROM A BOUNDARY LAYER ALONG A FLAT PLATE. I - INTERACTION OF WEAK SHOCK WAVES WITH LAMINAR AND TURBULENT BOUNDARY LAYERS ANALYZED BY MOMENTUM-INTEGRAL METHOD. Alfred Ritter and Yung-Huai Kuo, Cornell University. January 1953. 66p. diagrs., tab. (NACA TN 2868)

REFLECTION OF WEAK SHOCK WAVE FROM A BOUNDARY LAYER ALONG A FLAT PLATE. II - INTERACTION OF OBLIQUE SHOCK WAVE WITH A LAMINAR BOUNDARY LAYER ANALYZED BY DIFFERENTIAL-EQUATION METHOD. Yung-Huai Kuo, Cornell University. January 1953. 60p. diagrs. (NACA TN 2869)

*Turbulent Flow - Viscous (Cont.)*

EXPERIMENTAL INVESTIGATION OF LOSS IN AN ANNULAR CASCADE OF TURBINE-NOZZLE BLADES OF FREE VORTEX DESIGN. Hubert W. Allen, Milton G. Kofskey and Richard E. Chamness. January 1953. 33p. diagrs., photos., tab. (NACA TN 2871)

COMBINED EFFECT OF DAMPING SCREENS AND STREAM CONVERGENCE ON TURBULENCE. Maurice Tucker. January 1953. i, 62p. diagrs., tab. (NACA TN 2878)

UNSTEADY OBLIQUE INTERACTION OF A SHOCK WAVE WITH A PLANE DISTURBANCE. Franklin K. Moore. January 1953. 66p. diagrs. (NACA TN 2879)

ON THE THEORY OF THE TURBULENT BOUNDARY LAYER. (Über die Theorie der turbulenten Grenzschichten). J. Rotta. February 1953. 50p. diagrs. (NACA TM 1344. Trans. from Max-Planck-Institut für Strömungsforschung, Göttingen. Mitteilungen 1, 1950)

STUDY OF SECONDARY-FLOW PATTERNS IN AN ANNULAR CASCADE OF TURBINE NOZZLE BLADES WITH VORTEX DESIGN. Harold E. Rohlik, Hubert W. Allen and Howard Z. Herzig. March 1953. 29p. diagrs., photos. (NACA TN 2909)

A MODIFIED REYNOLDS ANALOGY FOR THE COMPRESSIBLE TURBULENT BOUNDARY LAYER ON A FLAT PLATE. Morris W. Rubesin. March 1953. 23p. diagrs., tab. (NACA TN 2917)

THE ZERO-LIFT DRAG OF A SLENDER BODY OF REVOLUTION (NACA RM-10 RESEARCH MODEL) AS DETERMINED FROM TESTS IN SEVERAL WIND TUNNELS AND IN FLIGHT AT SUPERSONIC SPEEDS. Albert J. Evans. April 1953. 40p. diagrs., tab. (NACA TN 2944)

ANALYSIS OF HEAT TRANSFER AND FLUID FRICTION FOR FULLY DEVELOPED TURBULENT FLOW OF SUPERCRITICAL WATER WITH VARIABLE FLUID PROPERTIES IN A SMOOTH TUBE. Robert G. Deissler and Maynard F. Taylor. April 1953. 29p. diagrs. (NACA RM E53B17)

### JET MIXING (1.1.3.3)

TEMPERATURE SURVEY OF THE WAKE OF TWO CLOSELY LOCATED PARALLEL JETS. John L. Sloop and Gerald Morrell. February 6, 1950. 37p. diagrs., photos., 8 tabs. (NACA RM E9121) (Declassified from Confidential, 3/10/52)

TEMPERATURE AND PRESSURE DISTRIBUTIONS IN DUAL PARALLEL JETS IMPINGING ON THE GROUND FROM A TURBOJET ENGINE. J. Elmo Farmer, Francis S. Stepka and Floyd B. Garrett. February 20, 1950. 23p. diagrs., photo. (NACA RM E9L01) (Declassified from Confidential, 3/10/52)

SPECTRA AND DIFFUSION IN A ROUND TURBULENT JET. Stanley Corrsin and Mahinder S. Uberoi. 1951. ii, 21p. diagrs., photos. (NACA Rept. 1040. Formerly TN 2124)

AN INVESTIGATION OF THE EFFECTS OF JET-OUTLET CUTOFF ANGLE ON THRUST DIRECTION AND BODY PITCHING MOMENT. James R. Blackaby. June 1951. 39p. diagrs., photos., tab. (NACA TN 2379)

PRELIMINARY STUDY OF STABILITY OF FLOW FROM TWO DUCTS DISCHARGING INTO A COMMON DUCT. Albert I. Bellin, D. Richard Messina and Paul B. Richards, Harvard University. July 1951. 33p. diagrs., photos. (NACA TN 2417)

A GENERAL CORRELATION OF TEMPERATURE PROFILES DOWNSTREAM OF A HEATED AIR JET DIRECTED PERPENDICULARLY TO AN AIR STREAM. Edmund E. Callaghan and Robert S. Ruggeri. September 1951. 37p. diagrs. (NACA TN 2466)

CONTRIBUTIONS TO THE THEORY OF THE SPREADING OF A FREE JET ISSUING FROM A NOZZLE. (Zur Theorie der Ausbreitung eines aus einer Düse austretenden freien Strahls). W. Szablewski. November 1951. 72p. diagrs. (NACA TM 1311. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. UM 8003, September 1944).

ON REFLECTION OF SHOCK WAVES FROM BOUNDARY LAYERS. H. W. Liepmann, A. Roshko and S. Dhawan, California Institute of Technology. 1952. ii, 29p. diagrs., photos., tab. (NACA Rept. 1100. Formerly TN 2334)

A SURVEY OF THE AIRCRAFT-NOISE PROBLEM WITH SPECIAL REFERENCE TO ITS PHYSICAL ASPECTS. Harvey H. Hubbard. May 1952. 41p. diagrs., photos. (NACA TN 2701)

EXPERIMENTAL STUDIES OF NOISE FROM SUBSONIC JETS IN STILL AIR. Leslie W. Lassiter and Harvey H. Hubbard. August 1952. 35p. diagrs., photos., tab. (NACA TN 2757)

GENERAL CORRELATION OF TEMPERATURE PROFILES DOWNSTREAM OF A HEATED AIR JET DIRECTED AT VARIOUS ANGLES TO AIR STREAM. Robert S. Ruggeri. December 1952. 59p. diagrs., tab. (NACA TN 2855)

ON THE STABILITY OF THE LAMINAR MIXING REGION BETWEEN TWO PARALLEL STREAMS IN A GAS. C. C. Lin, Massachusetts Institute of Technology. January 1953. 50p. diagrs., 5 tabs. (NACA TN 2887)

## AERODYNAMICS WITH HEAT (1.1.4)

### A COMPARISON OF THEORY AND EXPERIMENT FOR HIGH-SPEED FREE-MOLECULE FLOW.

Jackson R. Stalder, Glen Goodwin and Marcus O. Creager. 1951. ii, 22p. diags., photos. (NACA Rept. 1032. Formerly NACA TN 2244)

COMPARISON OF THEORETICAL AND EXPERIMENTAL HEAT-TRANSFER CHARACTERISTICS OF BODIES OF REVOLUTION AT SUPERSONIC SPEEDS. Richard Scherrer. 1951. ii, 15p. diags., photo. (NACA Rept. 1055. Formerly RM A8L28; TN 1975; TN 2087; TN 2131; TN 2148)

INVISCID FLOW ABOUT AIRFOILS AT HIGH SUPERSONIC SPEEDS. A. J. Eggers, Jr. and Clarence A. Syvertson. March 1952. 65p. diags., tab. (NACA TN 2646)

EXPERIMENTAL INVESTIGATION OF THE TURBULENT-BOUNDARY-LAYER TEMPERATURE-RECOVERY FACTOR ON BODIES OF REVOLUTION AT MACH NUMBERS FROM 2.0 TO 3.8. Howard A. Stine and Richard Scherrer. March 1952. 20p. diags. (NACA TN 2664)

EXPERIMENTAL INVESTIGATION OF HEAT TRANSFER THROUGH LAMINAR AND TURBULENT BOUNDARY LAYERS ON A COOLED FLAT PLATE AT A MACH NUMBER OF 2.4. Ellis G. Slack. April 1952. 31p. diags. (NACA TN 2686)

INTERACTION OF OBLIQUE SHOCK WAVES WITH REGIONS OF VARIABLE PRESSURE, ENTROPY, AND ENERGY. W. E. Moeckel. June 1952. 34p. diags. (NACA TN 2725)

AN ANALYSIS OF SUPERSONIC FLOW IN THE REGION OF THE LEADING EDGE OF CURVED AIRFOILS, INCLUDING CHARTS FOR DETERMINING SURFACE-PRESSURE GRADIENT AND SHOCK-WAVE CURVATURE. Samuel Kraus. June 1952. 45p. diags., 5 tabs. (NACA TN 2729)

SECOND APPROXIMATION TO LAMINAR COMPRESSIBLE BOUNDARY LAYER ON FLAT PLATE IN SLIP FLOW. Stephen H. Maslen. November 1952. 38p. diag., tab. (NACA TN 2818)

ICING PROTECTION FOR A TURBOJET TRANSPORT AIRPLANE: HEATING REQUIREMENTS, METHODS OF PROTECTION, AND PERFORMANCE PENALTIES. Thomas F. Gelder, James P. Lewis and Stanley L. Koutz. January 1953. i, 57p. diags., tab. (NACA TN 2866)

A MODIFIED REYNOLDS ANALOGY FOR THE COMPRESSIBLE TURBULENT BOUNDARY LAYER ON A FLAT PLATE. Morris W. Rubesin. March 1953. 23p. diags., tab. (NACA TN 2917)

## HEATING (1.1.4.1)

COMPARISON OF HEAT TRANSFER FROM AIRFOIL IN NATURAL AND SIMULATED ICING CONDITIONS. Thomas F. Gelder and James P. Lewis. September 1951. 51p. diags., photos., 2 tabs. (NACA TN 2480)

EXPERIMENTAL INVESTIGATION OF HEAT TRANSFER THROUGH LAMINAR AND TURBULENT BOUNDARY LAYERS ON A COOLED FLAT PLATE AT A MACH NUMBER OF 2.4. Ellis G. Slack. April 1952. 31p. diags. (NACA TN 2686)

ANALYTICAL INVESTIGATION OF ICING LIMIT FOR DIAMOND-SHAPED AIRFOIL IN TRANSONIC AND SUPERSONIC FLOW. Edmund E. Callaghan and John S. Serafini. January 1953. 18p. diags. (NACA TN 2861)

A METHOD FOR RAPID DETERMINATION OF THE ICING LIMIT OF A BODY IN TERMS OF THE STREAM CONDITIONS. Edmund E. Callaghan and John S. Serafini. March 1953. 33p. diags. (NACA TN 2914)

A MODIFIED REYNOLDS ANALOGY FOR THE COMPRESSIBLE TURBULENT BOUNDARY LAYER ON A FLAT PLATE. Morris W. Rubesin. March 1953. 23p. diags., tab. (NACA TN 2917)

AN ANALYTICAL STUDY OF HEAT REQUIREMENTS FOR ICING PROTECTION OF RANDOMES. James P. Lewis. March 1953. 20p. diags. (NACA RM E53A22)

## HEAT TRANSFER (1.1.4.2)

MEASUREMENTS OF AVERAGE HEAT-TRANSFER AND FRICTION COEFFICIENTS FOR SUBSONIC FLOW OF AIR IN SMOOTH TUBES AT HIGH SURFACE AND FLUID TEMPERATURES. Leroy V. Humble, Warren H. Lowdermilk and Leland G. Desmon. 1951. 15p. diags. (NACA Rept. 1020. Formerly RM E7L31; RM E8L03; RM E50E23; RM E50H23)

SPECTRA AND DIFFUSION IN A ROUND TURBULENT JET. Stanley Corrsin and Mahinder S. Uberoi. 1951. ii, 21p. diags., photos. (NACA Rept. 1040. Formerly TN 2124)

TABLES OF EXACT LAMINAR-BOUNDARY-LAYER SOLUTIONS WHEN THE WALL IS POROUS AND FLUID PROPERTIES ARE VARIABLE. W. Byron Brown and Patrick L. Donoughe. September 1951. 68p. diags., 2 tabs. (NACA TN 2479)

COMPARISON OF HEAT TRANSFER FROM AIRFOIL IN NATURAL AND SIMULATED ICING CONDITIONS. Thomas F. Gelder and James P. Lewis. September 1951. 51p. diags., photos., 2 tabs. (NACA TN 2480)

BEHAVIOR OF FAST MOVING FLOW OF COMPRESSIBLE GAS IN CYLINDRICAL PIPE IN PRESENCE OF COOLING. (K Voprosu o Povedenii Bystrodvizhushchegosya Potoka Szhimamogo Gaza v Pryamoi Tsilindricheskoi Trube pri Nalichii Okhlazhdeniya). G. A. Varshavsky. September 1951. 8p. diags. (NACA TM 1274. Trans. from Zhurnal Tekhnicheskoi Fiziki, v.16, no.4, 1946, p.413-416).

*Heat Transfer - Aerodynamic (Cont.)*

LAMINAR FRICTION AND HEAT TRANSFER AT MACH NUMBERS FROM 1 TO 10. E. B. Klunker and F. Edward McLean. October 1951. 22p. diags. (NACA TN 2499)

ANALYSIS OF TEMPERATURE DISTRIBUTION IN LIQUID-COOLED TURBINE BLADES. John N. B. Livingood and W. Byron Brown. 1952. ii, 21p. diags. (NACA Rept. 1066. Formerly TN 2321)

HEAT TRANSFER TO BODIES IN A HIGH-SPEED RAREFIED-GAS STREAM. Jackson R. Stalder, Glen Goodwin and Marcus O. Creager. 1952. ii, 10p. diags., tab. (NACA Rept. 1093. Formerly TN 2438)

INVESTIGATION OF LAMINAR BOUNDARY LAYER IN COMPRESSIBLE FLUIDS USING THE CROCCO METHOD. E. R. Van Driest, North American Aviation, Inc. January 1952. 78p. diags., 3 tabs. (NACA TN 2597)

EXPERIMENTAL DETERMINATION OF TIME CONSTANTS AND NUSSELT NUMBERS FOR BARE-WIRE THERMOCOUPLES IN HIGH-VELOCITY AIR STREAMS AND ANALYTIC APPROXIMATION OF CONDUCTION AND RADIATION ERRORS. Marvin D. Scadron and Isidore Warshawsky. January 1952. 81p. diags., 4 tabs. (NACA TN 2599)

PRELIMINARY RESULTS OF CYCLICAL DE-ICING OF A GAS-HEATED AIRFOIL. V. H. Gray, D. T. Bowden and U. von Glahn. January 1952. 38p. photos., diags., tab. (NACA RM E51J29)

AN ANALYSIS OF LAMINAR FREE-CONVECTION FLOW AND HEAT TRANSFER ABOUT A FLAT PLATE PARALLEL TO THE DIRECTION OF THE GENERATING BODY FORCE. Simon Ostrach. February 1952. 47p. diags., tab. (NACA TN 2635)

PRELIMINARY INVESTIGATION OF CYCLIC DE-ICING OF AN AIRFOIL USING AN EXTERNAL ELECTRIC HEATER. James P. Lewis and Dean T. Bowden. February 1952. 43p. photos., diags. (NACA RM E51J30)

EXPERIMENTAL INVESTIGATION OF THE TURBULENT-BOUNDARY-LAYER TEMPERATURE-RECOVERY FACTOR ON BODIES OF REVOLUTION AT MACH NUMBERS FROM 2.0 TO 3.8. Howard A. Stine and Richard Scherrer. March 1952. 20p. diags. (NACA TN 2664)

EXPERIMENTAL INVESTIGATION OF HEAT TRANSFER THROUGH LAMINAR AND TURBULENT BOUNDARY LAYERS ON A COOLED FLAT PLATE AT A MACH NUMBER OF 2.4. Ellis G. Slack. April 1952. 31p. diags. (NACA TN 2686)

ELECTRICAL TECHNIQUES FOR COMPENSATION OF THERMAL TIME LAG OF THERMOCOUPLES AND RESISTANCE THERMOMETER ELEMENTS. Charles E. Shepard and Isidore Warshawsky. May 1952. ii, 85p. diags., photos., 9 tabs. (NACA TN 2703)

METHOD FOR CALCULATION OF HEAT TRANSFER IN LAMINAR REGION OF AIR FLOW AROUND CYLINDERS OF ARBITRARY CROSS SECTION (INCLUDING LARGE TEMPERATURE DIFFERENCES AND TRANSPIRATION COOLING). E. R. G. Eckert and John N. B. Livingood. June 1952. 71p. diags. (NACA TN 2733)

SOME EXPERIENCES REGARDING THE NONLINEARITY OF HOT WIRES. (Quelques expériences sur la non-linéarité des fils chauds). R. Betchov and W. Welling. June 1952. 13p. diags. (NACA TM 1223. Trans. from Koninklijke Nederlandsche Akademie van Wetenschappen te Amsterdam, Verhandelingen, v.53, no.4, 1950, p.432-439; Technische Hoogenschool te Delft, Laboratorium voor Aero- en Hydrodynamica. Mededeling 66).

NONLINEAR THEORY OF A HOT-WIRE ANEMOMETER. (Théorie non-linéaire de l'anémomètre à fil chaud). R. Betchov. July 1952. 23p. diags. (NACA TM 1346. Trans. from Koninklijke Nederlandsche Akademie van Wetenschappen te Amsterdam, Verhandelingen, v. 52, no. 3, 1949, p. 195-207; Technische Hoogenschool te Delft, Laboratorium voor Aero- en Hydrodynamica. Mededeeling 61).

SOLUTIONS OF LAMINAR-BOUNDARY-LAYER EQUATIONS WHICH RESULT IN SPECIFIC-WEIGHT-FLOW PROFILES LOCALLY EXCEEDING FREE-STREAM VALUES. W. Byron Brown and John N. B. Livingood. September 1952. 36p. diags., 2 tabs. (NACA TN 2800)

SIMPLE GRAPHICAL SOLUTION OF HEAT TRANSFER AND EVAPORATION FROM SURFACE HEATED TO PREVENT ICING. Vernon H. Gray. October 1952. 19p. diags. (NACA TN 2799)

RADIANT-INTERCHANGE CONFIGURATION FACTORS. D. C. Hamilton and W. R. Morgan, Purdue University. December 1952. 110p. diags., photos., 14 tabs. (NACA TN 2836)

AUXILIARY EQUIPMENT AND TECHNIQUES FOR ADAPTING THE CONSTANT-TEMPERATURE HOT-WIRE ANEMOMETER TO SPECIFIC PROBLEMS IN AIR-FLOW MEASUREMENTS. James C. Laurence and L. Gene Landes. December 1952. ii, 77p. diags., photos., 3 tabs. (NACA TN 2843)

LAMINAR NATURAL-CONVECTION FLOW AND HEAT TRANSFER OF FLUIDS WITH AND WITHOUT HEAT SOURCES IN CHANNELS WITH CONSTANT WALL TEMPERATURES. Simon Ostrach. December 1952. 55p. diags. (NACA TN 2863)

EFFECT OF VARIABLE VISCOSITY AND THERMAL CONDUCTIVITY ON HIGH-SPEED SLIP FLOW BETWEEN CONCENTRIC CYLINDERS. T. C. Lin and R. E. Street, University of Washington. February 1953. 122p. diags. (NACA TN 2895)

EFFECT OF THERMAL PROPERTIES ON LAMINAR-BOUNDARY-LAYER CHARACTERISTICS. E. B. Klunker and F. Edward McLean. March 1953. 29p. diags. (NACA TN 2916)

A MODIFIED REYNOLDS ANALOGY FOR THE COMPRESSIBLE TURBULENT BOUNDARY LAYER ON A FLAT PLATE. Morris W. Rubesin. March 1953. 23p. diags., tab. (NACA TN 2917)

PRESSURE DISTRIBUTIONS ABOUT FINITE WEDGES IN BOUNDED AND UNBOUNDED SUBSONIC STREAMS. Patrick L. Donoughe and Ernst I. Prasse. May 1953. 41p. diags., photos., 2 tabs. (NACA TN 2942)

ADDITIONS OF HEAT  
(1.1.4.3)

MEASUREMENTS OF AVERAGE HEAT-TRANSFER AND FRICTION COEFFICIENTS FOR SUBSONIC FLOW OF AIR IN SMOOTH TUBES AT HIGH SURFACE AND FLUID TEMPERATURES. Leroy V. Humble, Warren H. Lowdermilk and Leland G. Desmon. 1951. 15p. diagrs. (NACA Rept. 1020. Formerly RM E7L31; RM E8L03; RM E50E23; RM E50H23)

HEAT DELIVERY IN A COMPRESSIBLE FLOW AND APPLICATIONS TO HOT-WIRE ANEMOMETRY. Chan-Mou Tchen, National Bureau of Standards. August 1951. 63p. diagrs. (NACA TN 2436)

A GENERAL CORRELATION OF TEMPERATURE PROFILES DOWNSTREAM OF A HEATED AIR JET DIRECTED PERPENDICULARLY TO AN AIR STREAM. Edmund E. Callaghan and Robert S. Ruggeri. September 1951. 37p. diagrs. (NACA TN 2466)

COMPARISON OF HEAT TRANSFER FROM AIRFOIL IN NATURAL AND SIMULATED ICING CONDITIONS. Thomas F. Gelder and James P. Lewis. September 1951. 51p. diagrs., photos., 2 tabs. (NACA TN 2480)

CRITERIONS FOR CONDENSATION-FREE FLOW IN SUPERSONIC TUNNELS. Warren C. Burgess, Jr. and Ferris L. Seashore. December 1951. 39p. diagrs., photos., tab. (NACA TN 2518. Formerly RM E9E02)

EXPERIMENTAL INVESTIGATION OF HEAT TRANSFER THROUGH LAMINAR AND TURBULENT BOUNDARY LAYERS ON A COOLED FLAT PLATE AT A MACH NUMBER OF 2.4. Ellis G. Slack. April 1952. 31p. diagrs. (NACA TN 2686)

CONDENSATION OF AIR IN SUPERSONIC WIND TUNNELS AND ITS EFFECTS ON FLOW ABOUT MODELS. C. Frederick Hansen and George J. Nothwang. April 1952. 49p. photos., diagrs. (NACA TN 2690)

DIFFUSION OF HEAT FROM A LINE SOURCE IN ISOTROPIC TURBULENCE. Mahinder S. Uberoi and Stanley Corrsin, Johns Hopkins University. June 1952. 90p. diagrs., photos., tab. (NACA TN 2710)

EXPERIMENTAL INVESTIGATION OF AVERAGE HEAT-TRANSFER AND FRICTION COEFFICIENTS FOR AIR FLOWING IN CIRCULAR TUBES HAVING SQUARE-THREAD-TYPE ROUGHNESS. Eldon W. Sams. June 1952. 43p. diagrs., photos. (NACA RM E52D17)

GENERAL CORRELATION OF TEMPERATURE PROFILES DOWNSTREAM OF A HEATED AIR JET DIRECTED AT VARIOUS ANGLES TO AIR STREAM. Robert S. Ruggeri. December 1952. 59p. diagrs., tab. (NACA TN 2855)

ESTIMATED POWER REDUCTION BY WATER INJECTION IN A NONRETURN SUPERSONIC WIND TUNNEL. Morton Cooper and John R. Sevier, Jr. January 1953. 19p. diagrs., tab. (NACA TN 2856)

ANALYSIS OF HEAT ADDITION IN A CONVERGENT-DIVERGENT NOZZLE. Donald P. Hearth and Eugene Perchonok. April 1953. 18p. diagrs. (NACA TN 2938)

FLOW OF RAREFIED GASES  
(1.1.5)

A COMPARISON OF THEORY AND EXPERIMENT FOR HIGH-SPEED FREE-MOLECULE FLOW. Jackson R. Stalder, Glen Goodwin and Marcus O. Creager. 1951. ii, 22p. diagrs., photos. (NACA Rept. 1032. Formerly NACA TN 2244)

HEAT TRANSFER TO BODIES IN A HIGH-SPEED RAREFIED-GAS STREAM. Jackson R. Stalder, Glen Goodwin and Marcus O. Creager. 1952. ii, 10p. diagrs., tab. (NACA Rept. 1093. Formerly TN 2438)

SOLUTION OF THE NAVIER-STOKES EQUATION FOR SOURCE AND SINK FLOWS OF A VISCOUS HEAT-CONDUCTING COMPRESSIBLE FLUID. Robert V. Hess. February 1952. 60p. diagrs., tab. (NACA TN 2630)

SLIP FLOW  
(1.1.5.1)

THE FLOW OF GASES IN NARROW CHANNELS. (Über die Strömung von Gasen in engen Kanälen). R. E. H. Rasmussen. August 1951. 46p. diagrs., photo., 2 tabs. (NACA TM 1301. Trans. from Annalen der Physik, v.29, ser.5, no.8, August 1937, p.665-697)

VISCOSITIES OF AIR AND NITROGEN AT LOW PRESSURES. Herrick L. Johnston, Robert W. Mattox and Robert W. Powers, Ohio State University. November 1951. 22p. diagrs., 6 tabs. (NACA TN 2546)

EFFECT OF SLIP ON FLOW NEAR A STAGNATION POINT AND IN A BOUNDARY LAYER. T. C. Lin and S. A. Schaaf, University of California. December 1951. 28p. diagrs. (NACA TN 2568)

ESTIMATE OF SLIP EFFECT ON COMPRESSIBLE LAMINAR-BOUNDARY-LAYER SKIN FRICTION. Harold Mirels. January 1952. 22p. diagrs. (NACA TN 2609)

SECOND APPROXIMATION TO LAMINAR COMPRESSIBLE BOUNDARY LAYER ON FLAT PLATE IN SLIP FLOW. Stephen H. Maslen. November 1952. 38p. diagr., tab. (NACA TN 2818)

EFFECT OF VARIABLE VISCOSITY AND THERMAL CONDUCTIVITY ON HIGH-SPEED SLIP FLOW BETWEEN CONCENTRIC CYLINDERS. T. C. Lin and R. E. Street, University of Washington. February 1953. 122p. diagrs. (NACA TN 2895)

FREE-MOLECULE FLOW  
(1.1.5.2)

COMPARISON OF THEORY AND EXPERIMENT  
FOR HIGH-SPEED FREE-MOLECULE FLOW.  
Jackson R. Stalder, Glen Goodwin and Marcus O.  
Creager. 1951. ii, 22p. diagrs., photos. (NACA  
Rept. 1032. Formerly NACA TN 2244)

THEORETICAL AERODYNAMIC CHARACTER-  
ISTICS OF BODIES IN A FREE-MOLECULE-FLOW  
FIELD. Jackson R. Stalder and Vernon J. Zurick.  
July 1951. 40p. diagrs. (NACA TN 2423)

THE FLOW OF GASES IN NARROW CHANNELS.  
(Über die Strömung von Gasen in engen Kanälen).  
R. E. H. Rasmussen. August 1951. 46p. diagrs.,  
photo., 2 tabs. (NACA TM 1301. Trans. from  
Annalen der Physik, v.29, ser.5, no.8, August 1937,  
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VISCOSITIES OF AIR AND NITROGEN AT LOW  
PRESSURES. Herrick L. Johnston, Robert W.  
Mattox and Robert W. Powers, Ohio State University.  
November 1951. 22p. diagrs., 6 tabs. (NACA TN  
2546)

HEAT TRANSFER TO BODIES IN A HIGH-SPEED  
RAREFIED-GAS STREAM. Jackson R. Stalder,  
Glen Goodwin and Marcus O. Creager. 1952. ii,  
10p. diagrs., tab. (NACA Rept. 1093. Formerly  
TN 2438)



## Wings (1.2)

A METHOD OF SELECTING THE THICKNESS, HOLLOWNESS, AND SIZE OF A SUPERSONIC WING FOR LEAST DRAG AND SUFFICIENT BENDING STRENGTH AT SPECIFIED FLIGHT CONDITIONS. James L. Amick. July 1952. 38p. diags. (NACA TN 2754)

ON THE CALCULATION OF FLOW ABOUT OBJECTS TRAVELING AT HIGH SUPERSONIC SPEEDS. A. J. Eggers, Jr. October 1952. 25p. diags. (NACA TN 2811)

A NEW SHADOWGRAPH TECHNIQUE FOR OBSERVATION OF CONICAL FLOW PHENOMENA IN SUPERSONIC FLOW AND PRELIMINARY RESULTS OBTAINED FOR A TRIANGULAR WING. Eugene S. Love and Carl E. Grigsby. May 1953. 16p. diags., photos. (NACA TN 2950)

### WING SECTIONS (1.2.1)

COMPARISON BETWEEN THEORY AND EXPERIMENT FOR WINGS AT SUPERSONIC SPEEDS. Walter G. Vincenti. 1951. ii, 11p. diags., photos. (NACA Rept. 1033. Formerly TN 2100)

AN EMPIRICAL METHOD PERMITTING RAPID DETERMINATION OF THE AREA, RATE, AND DISTRIBUTION OF WATER-DROP IMPINGEMENT ON AN AIRFOIL OF ARBITRARY SECTION AT SUBSONIC SPEEDS: Norman R. Bergrun. September 1951. 151p. diags., 11 tabs. (NACA TN 2476)

WIND-TUNNEL INVESTIGATION OF EFFECTS OF VARIOUS AERODYNAMIC BALANCE SHAPES AND SWEEPBACK ON CONTROL-SURFACE CHARACTERISTICS OF SEMISPAN TAIL SURFACES WITH NACA 0009, 0015, 66-009, 66(215)-014, AND CIRCULAR-ARC AIRFOIL SECTIONS. John J. Harper, Georgia Institute of Technology. October 1951. 127p. diags., photos., 5 tabs. (NACA TN 2495)

EVALUATION OF HIGH-ANGLE-OF-ATTACK AERODYNAMIC-DERIVATIVE DATA AND STALL-FLUTTER PREDICTION TECHNIQUES. Robert L. Halfman, H. C. Johnson and S. M. Haley, Massachusetts Institute of Technology. November 1951. 154p. diags., photos., 11 tabs. (NACA TN 2533)

ELECTRICAL PRESSURE INTEGRATOR. Arleigh P. Helfer. January 1952. 44p. photos., diags., 2 tabs. (NACA TN 2607)

HIGH-SPEED SUBSONIC CHARACTERISTICS OF 16 NACA 6-SERIES AIRFOIL SECTIONS. Milton D. Van Dyke. March 1952. 65p. diags., tab. (NACA TN 2670. Formerly RM A7J23)

CORRECTIONS FOR LIFT, DRAG, AND MOMENT OF AN AIRFOIL IN A SUPERSONIC TUNNEL HAVING A GIVEN STATIC PRESSURE GRADIENT. H. F. Ludloff and M. B. Friedman, New York University. December 1952. 59p. diags. (NACA TN 2849)

AN ANALYSIS OF THE FACTORS AFFECTING THE LOSS IN LIFT AND SHIFT IN AERODYNAMIC CENTER PRODUCED BY THE DISTORTION OF A SWEEP WING UNDER AERODYNAMIC LOAD. Charles W. Mathews and Max C. Kurbjun. March 1953. 65p. diags. (NACA TN 2901)

### SECTION THEORY (1.2.1.1)

EFFECTS OF SYSTEMATIC CHANGES OF TRAILING-EDGE ANGLE AND LEADING-EDGE RADIUS ON THE VARIATION WITH MACH NUMBER OF THE AERODYNAMIC CHARACTERISTICS OF A 10-PERCENT-CHORD-THICK NACA AIRFOIL SECTION. James L. Summers and Donald J. Graham. September 26, 1949. 81p. diags., photos., 9 tabs. (NACA RM A9G18) (Declassified from Restricted, 6/11/53)

A DESIGN STUDY OF LEADING-EDGE INLETS FOR UNSWEPT WINGS. Robert E. Dannenberg. June 30, 1950. 56p. diags., photos., 3 tabs. (NACA RM A9K02b) (Declassified from Restricted, 6/11/53)

PRELIMINARY INVESTIGATION OF AIRFOIL CHARACTERISTICS IN THE LANGLEY ANNULAR TRANSONIC TUNNEL. Louis W. Habel and James H. Henderson. August 11, 1950. 21p. diags. (NACA RM L50E18) (Declassified from Confidential, 7/20/51)

A METHOD FOR PREDICTING THE LOW-SPEED CHORDWISE PRESSURE DISTRIBUTION OVER SHARP-EDGE AIRFOIL SECTIONS WITH PLAIN FLAPS AT THE LEADING AND TRAILING EDGES. Robert J. Nuber and Jones F. Cahill. October 2, 1950. 28p. diags. (NACA RM L50H17a) (Declassified from Restricted, 2/28/52)

STUDY OF EFFECTS OF SWEEP ON THE FLUTTER OF CANTILEVER WINGS. J. G. Barmby, H. J. Cunningham and I. E. Garrick. 1951. ii, 25p. diags., photo., 7 tabs. (NACA Rept. 1014. Formerly TN 2121; RM L8H30)

*Section Theory-Wings (Cont.)*

EQUATIONS AND CHARTS FOR THE RAPID ESTIMATION OF HINGE-MOMENT AND EFFECTIVENESS PARAMETERS FOR TRAILING-EDGE CONTROLS HAVING LEADING AND TRAILING EDGES SWEEP AHEAD OF THE MACH LINES. Kenneth L. Goin. 1951. ii, 71p. diagrs., 9 tabs. (NACA Rept. 1041. Formerly TN 2221)

ANALYSIS OF PURE-BENDING FLUTTER OF A CANTILEVER SWEEP WING AND ITS RELATION TO BENDING-TORSION FLUTTER. H. J. Cunningham. September 1951. 24p. diagrs. (NACA TN 2461)

MATHEMATICAL IMPROVEMENT OF METHOD FOR COMPUTING POISSON INTEGRALS INVOLVED IN DETERMINATION OF VELOCITY DISTRIBUTION ON AIRFOILS. I. Flügge-Lotz, Stanford University. October 1951. 84p. diagrs., 3 tabs. (NACA TN 2451)

A VELOCITY-CORRECTION FORMULA FOR THE CALCULATION OF TRANSONIC MACH NUMBER DISTRIBUTIONS OVER DIAMOND-SHAPED AIRFOILS. H. Reese Ivey and Keith C. Harder. November 1951. 28p. diagrs. (NACA TN 2527)

AIRFOIL PROFILES FOR MINIMUM PRESSURE DRAG AT SUPERSONIC VELOCITIES-GENERAL ANALYSIS WITH APPLICATION TO LINEARIZED SUPERSONIC FLOW. Dean R. Chapman. 1952. ii, 14p. diagrs. (NACA Rept. 1063. Formerly TN 2264)

TRANSONIC FLOW PAST A WEDGE PROFILE WITH DETACHED BOW WAVE. Walter G. Vincenti and Cleo B. Wagoner. 1952. ii, 30p. diagrs., tab. (NACA Rept. 1095. Formerly TN 2339; TN 2588)

COMPARISON OF SUPERSONIC MINIMUM-DRAG AIRFOILS DETERMINED BY LINEAR AND NON-LINEAR THEORY. E. B. Klunker and Keith C. Harder. February 1952. 19p. diagrs. (NACA TN 2623)

INVISID FLOW ABOUT AIRFOILS AT HIGH SUPERSONIC SPEEDS. A. J. Eggers, Jr. and Clarence A. Syvertson. March 1952. 65p. diagrs., tab. (NACA TN 2646)

ON THE APPLICATION OF TRANSONIC SIMILARITY RULES. John R. Spreiter. June 1952. 45p. diagrs. (NACA TN 2726)

AN ANALYSIS OF SUPERSONIC FLOW IN THE REGION OF THE LEADING EDGE OF CURVED AIRFOILS, INCLUDING CHARTS FOR DETERMINING SURFACE-PRESSURE GRADIENT AND SHOCK-WAVE CURVATURE. Samuel Kraus. June 1952. 45p. diagrs., 5 tabs. (NACA TN 2729)

ON THE DESIGN OF AIRFOILS IN WHICH THE TRANSITION OF THE BOUNDARY LAYER IS DELAYED. (Kyōkai no Sen'i o okuraseru Yokugata no tuite). Itiro Tani. October 1952. 74p. diagrs., 8 tabs. (NACA TM 1351. Trans. from Aeronautical Research Institute, Tokyo Imperial Univ., Rept. 250, v. 19, no. 1, January 1943).

THEORETICAL STUDY OF THE TRANSONIC LIFT OF A DOUBLE-WEDGE PROFILE WITH DETACHED BOW WAVE. Walter G. Vincenti and Cleo B. Wagoner. (Portions of this work were reported at the eighth International Congress on Theoretical and Applied Mechanics, Istanbul, Turkey, August 20-28, 1952). December 1952. 63p. diagrs., 2 tabs. (NACA TN 2832)

AN APPLICATION OF THE METHOD OF CHARACTERISTICS TO TWO-DIMENSIONAL TRANSONIC FLOWS WITH DETACHED SHOCK WAVES. Keith C. Harder and E. B. Klunker. March 1953. 16p. diagrs. (NACA TN 2910)

### SECTION VARIABLES (1.2.1.2)

TWO-DIMENSIONAL WIND-TUNNEL INVESTIGATION AT HIGH REYNOLDS NUMBERS OF TWO SYMMETRICAL CIRCULAR-ARC AIRFOIL SECTIONS WITH HIGH-LIFT DEVICES. William J. Underwood and Robert J. Nuber. March 12, 1947. 35p. diagrs., photos., 2 tabs. (NACA RM L6K22) (Reclassified from Restricted, 7/3/51)

TESTS OF THE NACA 64-010 AND 64A010 AIRFOIL SECTIONS AT HIGH SUBSONIC MACH NUMBERS. Albert D. Hemenover. July 8, 1949. 19p. diagrs., tab. (NACA RM A9E31) (Declassified from Restricted, 3/10/52)

THE EFFECT OF CHANGES IN THE LEADING-EDGE RADIUS ON THE AERODYNAMIC CHARACTERISTICS OF A SYMMETRICAL, 9-PERCENT-THICK AIRFOIL AT HIGH-SUBSONIC MACH NUMBERS. Milton D. Humphreys and Raymond A. Robinson. August 7, 1950. 48p. diagrs., photos., tab. (NACA RM L9L09) (Declassified from Confidential, 5/25/53)

EXAMPLES OF THREE REPRESENTATIVE TYPES OF AIRFOIL-SECTION STALL AT LOW SPEED. George B. McCullough and Donald E. Gault. September 1951. 52p. diagrs., photo., 6 tabs. (NACA TN 2502)

A VELOCITY-CORRECTION FORMULA FOR THE CALCULATION OF TRANSONIC MACH NUMBER DISTRIBUTIONS OVER DIAMOND-SHAPED AIRFOILS. H. Reese Ivey and Keith C. Harder. November 1951. 28p. diagrs. (NACA TN 2527)

HIGH-SPEED SUBSONIC CHARACTERISTICS OF 16 NACA 6-SERIES AIRFOIL SECTIONS. Milton D. Van Dyke. March 1952. 65p. diagrs., tab. (NACA TN 2670. Formerly RM A7J23)

ON THE DESIGN OF AIRFOILS IN WHICH THE TRANSITION OF THE BOUNDARY LAYER IS DELAYED. (Kyōkai no Sen'i o okuraseru Yokugata no tuite). Itiro Tani. October 1952. 74p. diagrs., 8 tabs. (NACA TM 1351. Trans. from Aeronautical Research Institute, Tokyo Imperial Univ., Rept. 250, v. 19, no. 1, January 1943).

A COMPARATIVE EXAMINATION OF SOME MEASUREMENTS OF AIRFOIL SECTION LIFT AND DRAG AT SUPERCRITICAL SPEEDS. Gerald E. Nitzberg and Stewart M. Crandall. November 1952. 30p. diagrs. (NACA TN 2825)

## AERODYNAMICS

### 26 WINGS (1.2)

#### *Section Variables-Wings (Cont.)*

AN APPLICATION OF THE METHOD OF CHARACTERISTICS TO TWO-DIMENSIONAL TRANSONIC FLOWS WITH DETACHED SHOCK WAVES. Keith C. Harder and E. B. Klunker. March 1953. 16p. diags. (NACA TN 2910)

#### Camber

##### (1.2.1.2.1)

THE EFFECTS OF REYNOLDS NUMBER ON THE APPLICATION OF NACA 16-SERIES AIRFOIL CHARACTERISTICS TO PROPELLER DESIGN. Harold E. Cleary. January 1952. 15p. diags. (NACA TN 2591. Formerly RM L7H12)

EFFECT OF LINEAR SPANWISE VARIATIONS OF TWIST AND CIRCULAR-ARC CAMBER ON LOW-SPEED STATIC STABILITY, ROLLING, AND YAWING CHARACTERISTICS OF A 45° SWEEPBACK WING OF ASPECT RATIO 4 AND TAPER RATIO 0.6. Byron M. Jaquet. August 1952. 27p. diags., 2 tabs. (NACA TN 2775)

EFFECTS OF INDEPENDENT VARIATIONS OF MACH NUMBER AND REYNOLDS NUMBER ON THE MAXIMUM LIFT COEFFICIENTS OF FOUR NACA 6-SERIES AIRFOIL SECTIONS. Stanley F. Racisz. November 1952. 32p. diags., 2 tabs. (NACA TN 2824)

DETERMINATION OF MEAN CAMBER SURFACES FOR WINGS HAVING UNIFORM CHORDWISE LOADING AND ARBITRARY SPANWISE LOADING IN SUBSONIC FLOW. S. Katzoff, M. Frances Faison and Hugh C. DuBose. May 1953. 43p. diags., tab. (NACA TN 2908)

#### Thickness

##### (1.2.1.2.2)

EFFECTS OF LEADING-EDGE RADIUS AND MAXIMUM THICKNESS-CHORD RATIO ON THE VARIATION WITH MACH NUMBER OF THE AERODYNAMIC CHARACTERISTICS OF SEVERAL THIN NACA AIRFOIL SECTIONS. Robert E. Berggren and Donald J. Graham. July 3, 1950. 65p. diags., 7 tabs. (NACA RM A50D04) (Declassified from Restricted, 6/11/53)

EQUATIONS AND CHARTS FOR THE RAPID ESTIMATION OF HINGE-MOMENT AND EFFECTIVENESS PARAMETERS FOR TRAILING-EDGE CONTROLS HAVING LEADING AND TRAILING EDGES SWEEP AHEAD OF THE MACH LINES. Kenneth L. Goin. 1951. ii, 71p. diags., 9 tabs. (NACA Rept. 1041. Formerly TN 2221)

INVESTIGATION OF NACA 64,2-432 AND 64,3-440 AIRFOIL SECTIONS WITH BOUNDARY-LAYER CONTROL AND AN ANALYTICAL STUDY OF THEIR POSSIBLE APPLICATIONS. Elmer A. Horton, Stanley F. Racisz and Nicholas J. Paradiso. July 1951. 40p. diags., photos., 2 tabs. (NACA TN 2405)

THE EFFECTS OF REYNOLDS NUMBER ON THE APPLICATION OF NACA 16-SERIES AIRFOIL CHARACTERISTICS TO PROPELLER DESIGN. Harold E. Cleary. January 1952. 15p. diags. (NACA TN 2591. Formerly RM L7H12)

SOME REMARKS ON AN APPROXIMATE METHOD OF ESTIMATING THE WAVE DRAG DUE TO THICKNESS AT SUPERSONIC SPEEDS OF THREE-DIMENSIONAL WINGS WITH ARBITRARY PROFILE. Kenneth Margolis. February 1952. 9p. (NACA TN 2619)

EFFECT OF COMPRESSIBILITY ON THE FLOW PAST A TWO-DIMENSIONAL BUMP. W. F. Lindsey and Bernard N. Daley. April 1952. 34p. diags., photos. (NACA TN 2484. Formerly RM L6K12b)

A METHOD OF SELECTING THE THICKNESS, HOLLOWNESS, AND SIZE OF A SUPERSONIC WING FOR LEAST DRAG AND SUFFICIENT BENDING STRENGTH AT SPECIFIED FLIGHT CONDITIONS. James L. Amick. July 1952. 38p. diags. (NACA TN 2754)

EFFECTS OF INDEPENDENT VARIATIONS OF MACH NUMBER AND REYNOLDS NUMBER ON THE MAXIMUM LIFT COEFFICIENTS OF FOUR NACA 6-SERIES AIRFOIL SECTIONS. Stanley F. Racisz. November 1952. 32p. diags., 2 tabs. (NACA TN 2824)

THEORETICAL STUDY OF THE TRANSONIC LIFT OF A DOUBLE-WEDGE PROFILE WITH DETACHED BOW WAVE. Walter G. Vincenti and Cleo B. Wagoner. (Portions of this work were reported at the eighth International Congress on Theoretical and Applied Mechanics, Istanbul, Turkey, August 20-28, 1952). December 1952. 63p. diags., 2 tabs. (NACA TN 2832)

AN ANALYSIS OF THE FACTORS AFFECTING THE LOSS IN LIFT AND SHIFT IN AERODYNAMIC CENTER PRODUCED BY THE DISTORTION OF A SWEEP WING UNDER AERODYNAMIC LOAD. Charles W. Mathews and Max C. Kurbjun. March 1953. 65p. diags. (NACA TN 2901)

CHARACTERISTICS OF A 15-PERCENT-CHORD AND A 35-PERCENT-CHORD PLAIN FLAP ON THE NACA 0006 AIRFOIL SECTION AT HIGH SUBSONIC SPEEDS. Richard J. Ilk. October 2, 1947. 33p. diags., tab. (NACA RM A7H19) (Declassified from Restricted, 5/6/53)

#### Thickness Distribution

##### (1.2.1.2.3)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diags. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

TESTS OF THE NACA 64-010 AND 64A010 AIRFOIL SECTIONS AT HIGH SUBSONIC MACH NUMBERS. Albert D. Hemenover. July 8, 1949. 19p. diags., tab. (NACA RM A9E31) (Declassified from Restricted, 3/10/52)

EFFECTS OF SYSTEMATIC CHANGES OF TRAILING-EDGE ANGLE AND LEADING-EDGE RADIUS ON THE VARIATION WITH MACH NUMBER OF THE AERODYNAMIC CHARACTERISTICS OF A 10-PERCENT-CHORD-THICK NACA AIRFOIL SECTION. James L. Summers and Donald J. Graham. September 26, 1949. 81p. diags., photos., 9 tabs. (NACA RM A9G18) (Declassified from Restricted, 6/11/53)

Thickness Distribution-Wing  
Sections (Cont.)

EFFECTS OF LEADING-EDGE RADIUS AND MAXIMUM THICKNESS-CHORD RATIO ON THE VARIATION WITH MACH NUMBER OF THE AERODYNAMIC CHARACTERISTICS OF SEVERAL THIN NACA AIRFOIL SECTIONS. Robert E. Berggren and Donald J. Graham. July 3, 1950. 65p. diagrs., 7 tabs. (NACA RM A50D04) (Declassified from Restricted, 6/11/53)

AIRFOIL PROFILES FOR MINIMUM PRESSURE DRAG AT SUPERSONIC VELOCITIES-GENERAL ANALYSIS WITH APPLICATION TO LINEARIZED SUPERSONIC FLOW. Dean R. Chapman. 1952. ii, 14p. diagrs. (NACA Rept. 1063. Formerly TN 2264)

COMPARISON OF SUPERSONIC MINIMUM-DRAG AIRFOILS DETERMINED BY LINEAR AND NON-LINEAR THEORY. E. B. Klunker and Keith C. Harder. February 1952. 19p. diagrs. (NACA TN 2623)

A COMPARATIVE EXAMINATION OF SOME MEASUREMENTS OF AIRFOIL SECTION LIFT AND DRAG AT SUPERCRITICAL SPEEDS. Gerald E. Nitzberg and Stewart M. Crandall. November 1952. 30p. diagrs. (NACA TN 2825)

Inlets and Exits  
(1.2.1.2.4)

A DESIGN STUDY OF LEADING-EDGE INLETS FOR UNSWEPT WINGS. Robert E. Dannenberg. June 30, 1950. 56p. diagrs., photos., 3 tabs. (NACA RM A9K02b) (Declassified from Restricted, 6/11/53)

Surface Conditions  
(1.2.1.2.5)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert R. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

AIRFOIL SECTIONS WITH BOUNDARY-LAYER CONTROL AND AN ANALYTICAL STUDY OF THEIR POSSIBLE APPLICATIONS. Elmer A. Horton, Stanley F. Racisz and Nicholas J. Paradiso. July 1951. 40p. diagrs., photos., 2 tabs. (NACA TN 2405)

IMPINGEMENT OF WATER DROPLETS ON AN NACA 65<sub>1</sub>-212 AIRFOIL AT AN ANGLE OF ATTACK OF 4°. Rinaldo J. Brun, John S. Serafini and George J. Moshos. September 1952. 47p. diagrs., tab. (NACA RM E52B12)

EFFECTS OF INDEPENDENT VARIATIONS OF MACH NUMBER AND REYNOLDS NUMBER ON THE MAXIMUM LIFT COEFFICIENTS OF FOUR NACA 6-SERIES AIRFOIL SECTIONS. Stanley F. Racisz. November 1952. 32p. diagrs., 2 tabs. (NACA TN 2824)

IMPINGEMENT OF CLOUD DROPLETS ON AERODYNAMIC BODIES AS AFFECTED BY COMPRESSIBILITY OF AIR FLOW AROUND THE BODY. Rinaldo J. Brun, John S. Serafini and Helen M. Callagher. March 1953. 20p. diagrs. (NACA TN 2903)

IMPINGEMENT OF WATER DROPLETS ON A CYLINDER IN AN INCOMPRESSIBLE FLOW FIELD AND EVALUATION OF ROTATING MULTICYLINDER METHOD FOR MEASUREMENT OF DROPLET-SIZE DISTRIBUTION, VOLUME-MEDIAN DROPLET SIZE, AND LIQUID-WATER CONTENT IN CLOUDS. Rinaldo J. Brun and Harry W. Mergler. March 1953. 71p. diagrs., photo., 4 tabs. (NACA TN 2904)

A METHOD FOR DETERMINING CLOUD-DROPLET IMPINGEMENT ON SWEEP WINGS. Robert G. Dorsch and Rinaldo J. Brun. April 1953. 29p. diagrs. (NACA TN 2931)

IMPINGEMENT OF WATER DROPLETS ON NACA 65<sub>1</sub>-208 AND 65<sub>1</sub>-212 AIRFOILS AT 4° ANGLE OF ATTACK. Rinaldo J. Brun, Helen M. Callagher and Dorothea E. Vogt. May 1953. 49p. diagrs. (NACA TN 2952)

DESIGNATED PROFILES  
(1.2.1.3)

COMPARATIVE DRAG MEASUREMENTS AT TRANSONIC SPEEDS OF AN NACA 65-006 AIRFOIL AND A SYMMETRICAL CIRCULAR-ARC AIRFOIL. Jim Rogers Thompson and Bernard W. Marschner. March 6, 1947. 16p. diagrs., photo. (NACA RM L6J30) (Declassified from Confidential, 7/20/51)

EFFECTS OF COMPRESSIBILITY ON THE CHARACTERISTICS OF FIVE AIRFOILS. Bernard N. Daley. April 25, 1947. 73p. diagrs., photos., tab. (NACA RM L6L16) (Declassified from Restricted, 6/5/53)

CHARACTERISTICS OF A 15-PERCENT-CHORD AND A 35-PERCENT-CHORD PLAIN FLAP ON THE NACA 0006 AIRFOIL SECTION AT HIGH SUBSONIC SPEEDS. Richard J. Ilk. October 2, 1947. 33p. diagrs., tab. (NACA RM A7H19) (Declassified from Restricted, 5/6/53)

AERODYNAMIC LOAD MEASUREMENTS OVER LEADING-EDGE AND TRAILING-EDGE PLAIN FLAPS ON A 6-PERCENT THICK SYMMETRICAL CIRCULAR-ARC AIRFOIL SECTION. William J. Underwood and Robert J. Nuber. October 22, 1947. 43p. diagrs., photos., 2 tabs. (NACA RM L7H04) (Reclassified from Restricted, 7/3/51)

TWO-DIMENSIONAL WIND-TUNNEL INVESTIGATION AT HIGH REYNOLDS NUMBERS OF AN NACA 65A006 AIRFOIL WITH HIGH-LIFT DEVICES. Robert J. Nuber and Stanley M. Gottlieb. February 4, 1948. 28p. diagrs., photos., tab. (NACA RM L7K06) (Declassified from Restricted, 6/29/53)

THE LANGLEY ANNULAR TRANSONIC TUNNEL AND PRELIMINARY TESTS OF AN NACA 66-006 AIRFOIL. Louis W. Habel. June 23, 1948. 23p. diagrs., photos. (NACA RM L8A23) (Declassified from Confidential, 7/20/51)

## AERODYNAMICS

### 28 WINGS (1.2)

#### *Designated Profiles-Wing Sections (Cont.)*

TWO-DIMENSIONAL WIND-TUNNEL INVESTIGATION OF A 6-PERCENT-THICK SYMMETRICAL CIRCULAR-ARC AIRFOIL SECTION WITH LEADING-EDGE AND TRAILING-EDGE HIGH-LIFT DEVICES DEFLECTED IN COMBINATION. Robert J. Nuber and Gail A. Cheesman. September 6, 1949. 29p. diagrs., photo., 3 tabs. (NACA RM L9G20) (Declassified from Restricted, 10/7/52)

ANALYSIS OF MEASURED PRESSURES ON AIRFOILS AT MACH NUMBERS NEAR 1. Louis W. Habel and Mason F. Miller. September 19, 1949. 25p. diagrs. (NACA RM L9G19) (Declassified from Confidential, 7/20/51)

PRELIMINARY INVESTIGATION OF AIRFOIL CHARACTERISTICS IN THE LANGLEY ANNULAR TRANSONIC TUNNEL. Louis W. Habel and James H. Henderson. August 11, 1950. 21p. diagrs. (NACA RM L50E18) (Declassified from Confidential, 7/20/51)

INVESTIGATION OF NACA 64,2-432 AND 64,3-440 AIRFOIL SECTIONS WITH BOUNDARY-LAYER CONTROL AND AN ANALYTICAL STUDY OF THEIR POSSIBLE APPLICATIONS. Elmer A. Horton, Stanley F. Racisz and Nicholas J. Paradiso. July 1951. 40p. diagrs., photos., 2 tabs. (NACA TN 2405)

EXAMPLES OF THREE REPRESENTATIVE TYPES OF AIRFOIL-SECTION STALL AT LOW SPEED. George B. McCullough and Donald E. Gault. September 1951. 52p. diagrs., photo., 6 tabs. (NACA TN 2502)

FLOW CHARACTERISTICS OVER A LIFTING WEDGE OF FINITE ASPECT RATIO WITH ATTACHED AND DETACHED SHOCK WAVES AT A MACH NUMBER OF 1.40. John H. Hilton, Jr. June 1952. 21p. diagrs., photos. (NACA TN 2712)

EFFECTS OF INDEPENDENT VARIATIONS OF MACH NUMBER AND REYNOLDS NUMBER ON THE MAXIMUM LIFT COEFFICIENTS OF FOUR NACA 6-SERIES AIRFOIL SECTIONS. Stanley F. Racisz. November 1952. 32p. diagrs., 2 tabs. (NACA TN 2824)

SECTION CHARACTERISTICS OF A 10.5-PERCENT-THICK AIRFOIL WITH AREA SUCTION AS AFFECTED BY CHORDWISE DISTRIBUTION OF PERMEABILITY. Robert E. Dannenberg and James A. Weiberg. December 1952. 52p. diagrs., photos., 3 tabs. (NACA TN 2847)

#### HIGH-LIFT DEVICES (1.2.1.4)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

#### Plain Flaps (1.2.1.4.1)

TWO-DIMENSIONAL WIND-TUNNEL INVESTIGATION AT HIGH REYNOLDS NUMBERS OF TWO SYMMETRICAL CIRCULAR-ARC AIRFOIL SECTIONS WITH HIGH-LIFT DEVICES. William J. Underwood and Robert J. Nuber. March 12, 1947. 35p. diagrs., photos., 2 tabs. (NACA RM L6K22) (Reclassified from Restricted, 7/3/51)

CHARACTERISTICS OF A 15-PERCENT-CHORD AND A 35-PERCENT-CHORD PLAIN FLAP ON THE NACA 0006 AIRFOIL SECTION AT HIGH SUBSONIC SPEEDS. Richard J. Ilk. October 2, 1947. 33p. diagrs., tab. (NACA RM A7H19) (Declassified from Restricted, 5/6/53)

AERODYNAMIC LOAD MEASUREMENTS OVER LEADING-EDGE AND TRAILING-EDGE PLAIN FLAPS ON A 6-PERCENT THICK SYMMETRICAL CIRCULAR-ARC AIRFOIL SECTION. William J. Underwood and Robert J. Nuber. October 22, 1947. 43p. diagrs., photos., 2 tabs. (NACA RM L7H04) (Reclassified from Restricted, 7/3/51)

TWO-DIMENSIONAL WIND-TUNNEL INVESTIGATION AT HIGH REYNOLDS NUMBERS OF AN NACA 65A006 AIRFOIL WITH HIGH-LIFT DEVICES. Robert J. Nuber and Stanley M. Gottlieb. February 4, 1948. 28p. diagrs., photos., tab. (NACA RM L7K06) (Declassified from Restricted, 6/29/53)

TWO-DIMENSIONAL WIND-TUNNEL INVESTIGATION OF A 6-PERCENT-THICK SYMMETRICAL CIRCULAR-ARC AIRFOIL SECTION WITH LEADING-EDGE AND TRAILING-EDGE HIGH-LIFT DEVICES DEFLECTED IN COMBINATION. Robert J. Nuber and Gail A. Cheesman. September 6, 1949. 29p. diagrs., photo., 3 tabs. (NACA RM L9G20) (Declassified from Restricted, 10/7/52)

A METHOD FOR PREDICTING THE LOW-SPEED CHORDWISE PRESSURE DISTRIBUTION OVER SHARP-EDGE AIRFOIL SECTIONS WITH PLAIN FLAPS AT THE LEADING AND TRAILING EDGES. Robert J. Nuber and Jones F. Cahill. October 2, 1950. 28p. diagrs. (NACA RM L50H17a) (Declassified from Restricted, 2/28/52)

EQUATIONS AND CHARTS FOR THE RAPID ESTIMATION OF HINGE-MOMENT AND EFFECTIVENESS PARAMETERS FOR TRAILING-EDGE CONTROLS HAVING LEADING AND TRAILING EDGES SWEEPED AHEAD OF THE MACH LINES. Kenneth L. Goin. 1951. ii, 71p. diagrs., 9 tabs. (NACA Rept. 1041. Formerly TN 2221)

INVESTIGATION AT LOW SPEED OF 45° AND 60° SWEEPBACK, TAPERED, LOW-DRAG WINGS EQUIPPED WITH VARIOUS TYPES OF FULL-SPAN, TRAILING-EDGE FLAPS. John J. Harper, Georgia Institute of Technology. October 1951. 53p. diagrs., photos., 3 tabs. (NACA TN 2468)

THEORETICAL SYMMETRIC SPAN LOADING DUE TO FLAP DEFLECTION FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS. John DeYoung. 1952. ii, 41p. diagrs., tabs. (NACA Rept. 1071. Formerly NACA TN 2278)

Split Flaps  
(1.2.1.4.2)

INVESTIGATION AT LOW SPEED OF 45° AND 60° SWEEPBACK, TAPERED, LOW-DRAG WINGS EQUIPPED WITH VARIOUS TYPES OF FULL-SPAN, TRAILING-EDGE FLAPS. John J. Harper, Georgia Institute of Technology. October 1951. 53p. diagrs., photos., 3 tabs. (NACA TN 2468)

Slotted Flaps  
(1.2.1.4.3)

INVESTIGATION AT LOW SPEED OF 45° AND 60° SWEEPBACK, TAPERED, LOW-DRAG WINGS EQUIPPED WITH VARIOUS TYPES OF FULL-SPAN, TRAILING-EDGE FLAPS. John J. Harper, Georgia Institute of Technology. October 1951. 53p. diagrs., photos., 3 tabs. (NACA TN 2468)

Leading-Edge Flaps  
(1.2.1.4.4)

TWO-DIMENSIONAL WIND-TUNNEL INVESTIGATION AT HIGH REYNOLDS NUMBERS OF TWO SYMMETRICAL CIRCULAR-ARC AIRFOIL SECTIONS WITH HIGH-LIFT DEVICES. William J. Underwood and Robert J. Nuber. March 12, 1947. 35p. diagrs., photos., 2 tabs. (NACA RM L6K22) (Reclassified from Restricted, 7/3/51)

AERODYNAMIC LOAD MEASUREMENTS OVER LEADING-EDGE AND TRAILING-EDGE PLAIN FLAPS ON A 6-PERCENT THICK SYMMETRICAL CIRCULAR-ARC AIRFOIL SECTION. William J. Underwood and Robert J. Nuber. October 22, 1947. 43p. diagrs., photos., 2 tabs. (NACA RM L7H04) (Reclassified from Restricted, 7/3/51)

TWO-DIMENSIONAL WIND-TUNNEL INVESTIGATION AT HIGH REYNOLDS NUMBERS OF AN NACA 65A006 AIRFOIL WITH HIGH-LIFT DEVICES. Robert J. Nuber and Stanley M. Gottlieb. February 4, 1948. 28p. diagrs., photos., tab. (NACA RM L7K06) (Declassified from Restricted, 6/29/53)

TWO-DIMENSIONAL WIND-TUNNEL INVESTIGATION OF A 6-PERCENT-THICK SYMMETRICAL CIRCULAR-ARC AIRFOIL SECTION WITH LEADING-EDGE AND TRAILING-EDGE HIGH-LIFT DEVICES DEFLECTED IN COMBINATION. Robert J. Nuber and Gail A. Cheesman. September 6, 1949. 29p. diagrs., photo., 3 tabs. (NACA RM L9G20) (Declassified from Restricted, 10/7/52)

A METHOD FOR PREDICTING THE LOW-SPEED CHORDWISE PRESSURE DISTRIBUTION OVER SHARP-EDGE AIRFOIL SECTIONS WITH PLAIN FLAPS AT THE LEADING AND TRAILING EDGES. Robert J. Nuber and Jones F. Cahill. October 2, 1950. 28p. diagrs. (NACA RM L50H17a) (Declassified from Restricted, 2/28/52)

THE THEORETICAL CHARACTERISTICS OF TRIANGULAR-TIP CONTROL SURFACES AT SUPERSONIC SPEEDS. MACH LINES BEHIND TRAILING EDGES. Julian H. Kainer and Mary Dowd King. July 1952. 76p. diagrs., 4 tabs. (NACA TN 2715)

Slots and Slats  
(1.2.1.4.5)

TWO-DIMENSIONAL WIND-TUNNEL INVESTIGATION OF A 6-PERCENT-THICK SYMMETRICAL CIRCULAR-ARC AIRFOIL SECTION WITH LEADING-EDGE AND TRAILING-EDGE HIGH-LIFT DEVICES DEFLECTED IN COMBINATION. Robert J. Nuber and Gail A. Cheesman. September 6, 1949. 29p. diagrs., photo., 3 tabs. (NACA RM L9G20) (Declassified from Restricted, 10/7/52)

CONTROLS  
(1.2.1.5)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

THREE PAPERS FROM CONFERENCE ON "WING AND TAIL-SURFACE OSCILLATIONS" - MARCH 6-8, 1941, MUNICH. I. REMARKS CONCERNING AERODYNAMICALLY BALANCED CONTROL SURFACES. (Bemerkung zum aerodynamisch innen ausgeglichenen Ruder). H. Söhngen. II. AERODYNAMICALLY EQUIVALENT SYSTEMS FOR VARIOUS FORMS OF CONTROL SURFACES WITHIN THE SCOPE OF THE TWO-DIMENSIONAL WING THEORY. (Aerodynamische Ersatzsysteme für verschiedene Ruderformen im Rahmen der zweidimensionalen Tragflächentheorie). L. Schwarz. III. COMPARATIVE CALCULATIONS CONCERNING AERODYNAMIC BALANCE OF CONTROL SURFACES. (Vergleichsrechnungen zum aerodynamischen Ruderinnen ausgleich). F. Dietze. August 1951. 47p. diagrs., tab. (NACA TM 1306. Trans. from Lillenthal Gesellschaft für Luftfahrtforschung, Berlin. Bericht 135, p.61-74)

Flap Type  
(1.2.1.5.1)

CHARACTERISTICS OF A 15-PERCENT-CHORD AND A 35-PERCENT-CHORD PLAIN FLAP ON THE NACA 0006 AIRFOIL SECTION AT HIGH SUBSONIC SPEEDS. Richard J. Ilk. October 2, 1947. 33p. diagrs., tab. (NACA RM A7H19) (Declassified from Restricted, 5/6/53)

EQUATIONS AND CHARTS FOR THE RAPID ESTIMATION OF HINGE-MOMENT AND EFFECTIVENESS PARAMETERS FOR TRAILING-EDGE CONTROLS HAVING LEADING AND TRAILING EDGES SWEEPED AHEAD OF THE MACH LINES. Kenneth L. Goin. 1951. ii, 71p. diagrs., 9 tabs. (NACA Rept. 1041. Formerly TN 2221)

THEORETICAL CHARACTERISTICS OF TWO-DIMENSIONAL SUPERSONIC CONTROL SURFACES. Robert R. Morrisette and Lester F. Oborny. October 1951. 74p. diagrs., tab. (NACA TN 2486. Formerly RM L8G12)

EFFECT OF VARIOUS PARAMETERS INCLUDING MACH NUMBER ON THE SINGLE-DEGREE-OF-FREEDOM FLUTTER OF A CONTROL SURFACE IN POTENTIAL FLOW. Harry L. Runyan. December 1951. 33p. diagrs. (NACA TN 2551)

BOUNDARY LAYER  
(1.2.1.6)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diags. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

ANALYSIS OF MEASURED PRESSURES ON AIRFOILS AT MACH NUMBERS NEAR 1. Louis W. Habel and Mason F. Miller. September 19, 1949. 25p. diags. (NACA RM L9G19) (Declassified from Confidential, 7/20/51)

FLIGHT INVESTIGATION OF THE EFFECT OF BOUNDARY-LAYER SUCTION ON PROFILE-DRAG COEFFICIENT AT SUPERCRITICAL MACH NUMBERS. Richard B. Skoog. September 20, 1949. 30p. diags., photos. (NACA RM A9D04) (Declassified from Confidential, 6/29/53)

EXPERIMENTAL AND THEORETICAL STUDIES OF AREA SUCTION FOR THE CONTROL OF THE LAMINAR BOUNDARY LAYER ON AN NACA 64A010 AIRFOIL. Albert L. Braslow, Dale L. Burrows, Neal Tetervin and Fioravante Visconti. 1951. ii, 19p. diags., photos. (NACA Rept. 1025. Formerly TN 1905; TN 2112)

INVESTIGATION OF NACA 64,2-432 AND 64,3-440 AIRFOIL SECTIONS WITH BOUNDARY-LAYER CONTROL AND AN ANALYTICAL STUDY OF THEIR POSSIBLE APPLICATIONS. Elmer A. Horton, Stanley F. Racisz and Nicholas J. Paradiso. July 1951. 40p. diags., photos., 2 tabs. (NACA TN 2405)

FLOW SEPARATION AHEAD OF BLUNT BODIES AT SUPERSONIC SPEEDS. W. E. Moeckel. July 1951. 39p. diags., photos. (NACA TN 2418)

APPROXIMATE METHOD OF INTEGRATION OF LAMINAR BOUNDARY LAYER IN INCOMPRESSIBLE FLUID. (Priblizhennyi Metod Integrirrovania Uravnenii Laminarnogo Pogranichnogo Sloia v Neszhimaemom Gaze). L. G. Loitsianskii. July 1951. 21p. diags. (NACA TM 1293. Trans. from Prikladnaya Matematika i Mekhanika, v.13, no.5, Oct. 1949, p.513-525).

A PROCEDURE FOR CALCULATING THE DEVELOPMENT OF TURBULENT BOUNDARY LAYERS UNDER THE INFLUENCE OF ADVERSE PRESSURE GRADIENTS. Kennedy F. Rubert and Jerome Persh. September 1951. 61p. diags. (NACA TN 2478)

EXAMPLES OF THREE REPRESENTATIVE TYPES OF AIRFOIL-SECTION STALL AT LOW SPEED. George B. McCullough and Donald E. Gault. September 1951. 52p. diags., photo., 6 tabs. (NACA TN 2502)

ON REFLECTION OF SHOCK WAVES FROM BOUNDARY LAYERS. H. W. Liepmann, A. Roshko and S. Dhawan, California Institute of Technology. 1952. ii, 29p. diags., photos., tab. (NACA Rept. 1100. Formerly TN 2334)

EXPERIMENTAL INVESTIGATION OF AN NACA 64A010 AIRFOIL SECTION WITH 41 SUCTION SLOTS ON EACH SURFACE FOR CONTROL OF LAMINAR BOUNDARY LAYER. Dale L. Burrows and Milton A. Schwartzberg. April 1952. 37p. diags., photos. (NACA TN 2644)

EXPERIMENTAL STUDY OF THE EFFECTS OF FINITE SURFACE DISTURBANCES AND ANGLE OF ATTACK ON THE LAMINAR BOUNDARY LAYER ON AN NACA 64A010 AIRFOIL WITH AREA SUCTION. Milton A. Schwartzberg and Albert L. Braslow. October 1952. 35p. diags. (NACA TN 2796)

INVESTIGATION WITH AN INTERFEROMETER OF THE FLOW AROUND A CIRCULAR-ARC AIRFOIL AT MACH NUMBERS BETWEEN 0.6 AND 0.9. George P. Wood and Paul B. Gooderum. October 1952. 80p. diags., photos., tab. (NACA TN 2801)

EXPERIMENTS ON TRANSONIC FLOW AROUND WEDGES. George P. Wood. November 1952. 34p. diags., photos., tab. (NACA TN 2829)

Characteristics  
(1.2.1.6.1)

A GENERAL INTEGRAL FORM OF THE BOUNDARY-LAYER EQUATION FOR INCOMPRESSIBLE FLOW WITH AN APPLICATION TO THE CALCULATION OF THE SEPARATION POINT OF TURBULENT BOUNDARY LAYERS. Neal Tetervin and Chia Chiao Lin. 1951. 19p. diags. (NACA Rept. 1046. Formerly TN 2158)

SKIN FRICTION OF INCOMPRESSIBLE TURBULENT BOUNDARY LAYERS UNDER ADVERSE PRESSURE GRADIENTS. Fabio R. Goldschmied. August 1951. 65p. diags. (NACA TN 2431)

A COMPARISON OF THE TURBULENT BOUNDARY-LAYER GROWTH ON AN UNSWEPT AND A SWEEPED WING. John M. Altman and Nora-Lee F. Hayter. September 1951. 30p. diags., photos. (NACA TN 2500)

SCHLIEREN INVESTIGATION OF THE WING SHOCK-WAVE BOUNDARY-LAYER INTERACTION IN FLIGHT. George E. Cooper and Richard S. Bray. September 1951. 26p. diags., photos. (NACA RM A51G09)

TRANSITION CAUSED BY THE LAMINAR FLOW SEPARATION. (Sōryu-Hakuri ni tomonau Sen'i ni kansuru Kenkyū). T. Maekawa and S. Atsumi. September 1952. 14p. diags., 2 tabs. (NACA TM 1352. Trans. from Society of Applied Mechanics of Japan, Journal, v.1, no.6, November 1948, p.187-192)

ON THE DESIGN OF AIRFOILS IN WHICH THE TRANSITION OF THE BOUNDARY LAYER IS DELAYED. (Kyōkai no Sen'i o okuraseru Yokugata no tuite). Itiro Tani. October 1952. 74p. diags., 8 tabs. (NACA TM 1351. Trans. from Aeronautical Research Institute, Tokyo Imperial Univ., Rept. 250, v.19, no.1, January 1943).

*Characteristics-Wing Sections*  
(Cont.)

SECTION CHARACTERISTICS OF A 10.5-PERCENT-THICK AIRFOIL WITH AREA SUCTION AS AFFECTED BY CHORDWISE DISTRIBUTION OF PERMEABILITY. Robert E. Dannenberg and James A. Weiberg. December 1952. 52p. diagrs., photos., 3 tabs. (NACA TN 2847)

INTERACTION BETWEEN A SUPERSONIC STREAM AND A PARALLEL SUBSONIC STREAM BOUNDED BY FLUID AT REST. Herbert S. Ribner and E. Leonard Arnoff. December 1952. 45p. diagrs., 2 tabs. (NACA TN 2860)

FACTORS AFFECTING LAMINAR BOUNDARY LAYER MEASUREMENTS IN A SUPERSONIC STREAM. Robert E. Blue and George M. Low. Appendix B: REDUCTION OF DATA. Jack M. Lande. February 1953. 49p. diagrs. (NACA TN 2891)

Control  
(1.2.1.6.2)

A STUDY OF THE STABILITY OF THE LAMINAR BOUNDARY LAYER AS AFFECTED BY CHANGES IN THE BOUNDARY-LAYER THICKNESS IN REGIONS OF PRESSURE GRADIENT AND FLOW THROUGH THE SURFACE. Neal Tetervin and David A. Levine. August 1952. 83p. diagrs., tab. (NACA TN 2752)

SECTION CHARACTERISTICS OF A 10.5-PERCENT-THICK AIRFOIL WITH AREA SUCTION AS AFFECTED BY CHORDWISE DISTRIBUTION OF PERMEABILITY. Robert E. Dannenberg and James A. Weiberg. December 1952. 52p. diagrs., photos., 3 tabs. (NACA TN 2847)

REYNOLDS NUMBER EFFECTS  
(1.2.1.7)

TWO-DIMENSIONAL WIND-TUNNEL INVESTIGATION AT HIGH REYNOLDS NUMBERS OF TWO SYMMETRICAL CIRCULAR-ARC AIRFOIL SECTIONS WITH HIGH-LIFT DEVICES. William J. Underwood and Robert J. Nuber. March 12, 1947. 35p. diagrs., photos., 2 tabs. (NACA RM L6K22) (Reclassified from Restricted, 7/3/51)

TWO-DIMENSIONAL WIND-TUNNEL INVESTIGATION AT HIGH REYNOLDS NUMBERS OF AN NACA 65A006 AIRFOIL WITH HIGH-LIFT DEVICES. Robert J. Nuber and Stanley M. Gottlieb. February 4, 1948. 28p. diagrs., photos., tab. (NACA RM L7K06) (Declassified from Restricted, 6/29/53)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

TWO-DIMENSIONAL WIND-TUNNEL INVESTIGATION OF A 6-PERCENT-THICK SYMMETRICAL CIRCULAR-ARC AIRFOIL SECTION WITH LEADING-EDGE AND TRAILING-EDGE HIGH-LIFT DEVICES DEFLECTED IN COMBINATION. Robert J. Nuber and Gail A. Cheesman. September 6, 1949. 29p. diagrs., photo., 3 tabs. (NACA RM L9G20) (Declassified from Restricted, 10/7/52)

FLIGHT INVESTIGATION OF THE EFFECT OF BOUNDARY-LAYER SUCTION ON PROFILE-DRAG COEFFICIENT AT SUPERCRITICAL MACH NUMBERS. Richard B. Skoog. September 20, 1949. 30p. diagrs., photos. (NACA RM A9D04) (Declassified from Confidential, 6/29/53)

EXPERIMENTAL AERODYNAMIC DERIVATIVES OF A SINUSOIDALLY OSCILLATING AIRFOIL IN TWO-DIMENSIONAL FLOW. Robert L. Halfman, Massachusetts Institute of Technology. November 1951. 83p. diagrs., photo., 19 tabs. (NACA TN 2465)

THE EFFECTS OF REYNOLDS NUMBER ON THE APPLICATION OF NACA 16-SERIES AIRFOIL CHARACTERISTICS TO PROPELLER DESIGN. Harold E. Cleary. January 1952. 15p. diagrs. (NACA TN 2591. Formerly RM L7H12)

TRANSITION CAUSED BY THE LAMINAR FLOW SEPARATION. (Sōryu-Hakuri ni tomonau Sen'i ni kansuru Kenkyū). T. Maekawa and S. Atsumi. September 1952. 14p. diagrs., 2 tabs. (NACA TM 1352. Trans from Society of Applied Mechanics of Japan, Journal, v. 1, no. 6, November 1948, p. 187-192)

ON THE DESIGN OF AIRFOILS IN WHICH THE TRANSITION OF THE BOUNDARY LAYER IS DELAYED. (Kyōkaiiso no Sen'i o okuraseru Yokugata no tuite). Itiro Tani. October 1952. 74p. diagrs., 8 tabs. (NACA TM 1351. Trans. from Aeronautical Research Institute, Tokyo Imperial Univ., Rept. 250, v. 19, no. 1, January 1943).

EFFECTS OF INDEPENDENT VARIATIONS OF MACH NUMBER AND REYNOLDS NUMBER ON THE MAXIMUM LIFT COEFFICIENTS OF FOUR NACA 6-SERIES AIRFOIL SECTIONS. Stanley F. Racisz. November 1952. 32p. diagrs., 2 tabs. (NACA TN 2824)

MACH NUMBER EFFECTS  
(1.2.1.8)

EFFECTS OF COMPRESSIBILITY ON THE CHARACTERISTICS OF FIVE AIRFOILS. Bernard N. Daley. April 25, 1947. 73p. diagrs., photos., tab. (NACA RM L6L16) (Declassified from Restricted, 6/5/53)

CHARACTERISTICS OF A 15-PERCENT-CHORD AND A 35-PERCENT-CHORD PLAIN FLAP ON THE NACA 0006 AIRFOIL SECTION AT HIGH SUBSONIC SPEEDS. Richard J. Ilk. October 2, 1947. 33p. diagrs., tab. (NACA RM A7H19) (Declassified from Restricted, 5/6/53)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

TESTS OF THE NACA 64-010 AND 64A010 AIRFOIL SECTIONS AT HIGH SUBSONIC MACH NUMBERS. Albert D. Hemenover. July 8, 1949. 19p. diagrs., tab. (NACA RM A9E31) (Declassified from Restricted, 3/10/52)

FLIGHT INVESTIGATION OF THE EFFECT OF BOUNDARY-LAYER SUCTION ON PROFILE-DRAG COEFFICIENT AT SUPERCRITICAL MACH NUMBERS. Richard B. Skoog. September 20, 1949. 30p. diagrs., photos. (NACA RM A9D04) (Declassified from Confidential, 6/29/53)



**AERODYNAMICS**  
**32 WINGS (1.2)**

*Mach Number Effects-Wing  
Sections (Cont.)*

EFFECTS OF SYSTEMATIC CHANGES OF TRAILING-EDGE ANGLE AND LEADING-EDGE RADIUS ON THE VARIATION WITH MACH NUMBER OF THE AERODYNAMIC CHARACTERISTICS OF A 10-PERCENT-CHORD-THICK NACA AIRFOIL SECTION. James L. Summers and Donald J. Graham. September 26, 1949. 81p. diagrs., photos., 9 tabs. (NACA RM A9G18) (Declassified from Restricted, 6/11/53)

EFFECTS OF LEADING-EDGE RADIUS AND MAXIMUM THICKNESS-CHORD RATIO ON THE VARIATION WITH MACH NUMBER OF THE AERODYNAMIC CHARACTERISTICS OF SEVERAL THIN NACA AIRFOIL SECTIONS. Robert E. Berggren and Donald J. Graham. July 3, 1950. 65p. diagrs., 7 tabs. (NACA RM A50D04) (Declassified from Restricted, 6/11/53)

THE EFFECT OF CHANGES IN THE LEADING-EDGE RADIUS ON THE AERODYNAMIC CHARACTERISTICS OF A SYMMETRICAL, 9-PERCENT-THICK AIRFOIL AT HIGH-SUBSONIC MACH NUMBERS. Milton D. Humphreys and Raymond A. Robinson. August 7, 1950. 48p. diagrs., photos., tab. (NACA RM L9L09) (Declassified from Confidential, 5/25/53)

SCHLIEREN INVESTIGATION OF THE WING SHOCK-WAVE BOUNDARY-LAYER INTERACTION IN FLIGHT. George E. Cooper and Richard S. Bray. September 1951. 26p. diagrs., photos. (NACA RM A51G09)

THEORETICAL CHARACTERISTICS OF TWO-DIMENSIONAL SUPERSONIC CONTROL SURFACES. Robert R. Morrisette and Lester F. Oborny. October 1951. 74p. diagrs., tab. (NACA TN 2486. Formerly RM L8G12)

A VELOCITY-CORRECTION FORMULA FOR THE CALCULATION OF TRANSONIC MACH NUMBER DISTRIBUTIONS OVER DIAMOND-SHAPED AIRFOILS. H. Reese Ivey and Keith C. Harder. November 1951. 28p. diagrs. (NACA TN 2527)

AN EXPERIMENTAL INVESTIGATION OF TRANSONIC FLOW PAST TWO-DIMENSIONAL WEDGE AND CIRCULAR-ARC SECTIONS USING A MACH-ZEHNDER INTERFEROMETER. Arthur Earl Bryson, Jr., California Institute of Technology. November 1951. 97p. diagrs., photos. (NACA TN 2560)

NUMERICAL DETERMINATION OF INDICIAL LIFT OF TWO-DIMENSIONAL AIRFOILS AT SUBSONIC MACH NUMBERS FROM OSCILLATORY LIFT COEFFICIENTS WITH CALCULATIONS FOR MACH NUMBER 0.7. Bernard Mazelsky. December 1951. 38p. diagrs., tab. (NACA TN 2562)

AIRFOIL PROFILES FOR MINIMUM PRESSURE DRAG AT SUPERSONIC VELOCITIES-GENERAL ANALYSIS WITH APPLICATION TO LINEARIZED SUPERSONIC FLOW. Dean R. Chapman. 1952. ii, 14p. diagrs. (NACA Rept. 1063. Formerly TN 2264)

TRANSONIC FLOW PAST A WEDGE PROFILE WITH DETACHED BOW WAVE. Walter G. Vincenti and Cleo B. Wagoner. 1952. ii, 30p. diagrs., tab. (NACA Rept. 1095. Formerly TN 2339; TN 2588)

DETERMINATION OF INDICIAL LIFT AND MOMENT OF A TWO-DIMENSIONAL PITCHING AIRFOIL AT SUBSONIC MACH NUMBERS FROM OSCILLATORY COEFFICIENTS WITH NUMERICAL CALCULATIONS FOR A MACH NUMBER OF 0.7. Bernard Mazelsky. February 1952. 30p. diagrs., tab. (NACA TN 2613)

COMPARISON OF SUPERSONIC MINIMUM-DRAG AIRFOILS DETERMINED BY LINEAR AND NON-LINEAR THEORY. E. B. Klunker and Keith C. Harder. February 1952. 19p. diagrs. (NACA TN 2623)

INVISCID FLOW ABOUT AIRFOILS AT HIGH SUPERSONIC SPEEDS. A. J. Eggers, Jr. and Clarence A. Syvertson. March 1952. 65p. diagrs., tab. (NACA TN 2646)

EFFECT OF MACH NUMBER ON THE FLOW AND APPLICATION OF COMPRESSIBILITY CORRECTIONS IN A TWO-DIMENSIONAL SUBSONIC-TRANSONIC COMPRESSOR CASCADE HAVING VARIED POROUS-WALL SUCTION AT THE BLADE TIPS. William B. Briggs. March 1952. 43p. diagrs., photos. (NACA TN 2649)

HIGH-SPEED SUBSONIC CHARACTERISTICS OF 16 NACA 6-SERIES AIRFOIL SECTIONS. Milton D. Van Dyke. March 1952. 65p. diagrs., tab. (NACA TN 2670. Formerly RM A7J23)

EFFECT OF COMPRESSIBILITY ON THE FLOW PAST A TWO-DIMENSIONAL BUMP. W. F. Lindsey and Bernard N. Daléy. April 1952. 34p. diagrs., photos. (NACA TN 2484. Formerly RM L6K12b)

FLOW CHARACTERISTICS OVER A LIFTING WEDGE OF FINITE ASPECT RATIO WITH ATTACHED AND DETACHED SHOCK WAVES AT A MACH NUMBER OF 1.40. John H. Hilton, Jr. June 1952. 21p. diagrs., photos. (NACA TN 2712)

AN ANALYSIS OF SUPERSONIC FLOW IN THE REGION OF THE LEADING EDGE OF CURVED AIRFOILS, INCLUDING CHARTS FOR DETERMINING SURFACE-PRESSURE GRADIENT AND SHOCK-WAVE CURVATURE. Samuel Kraus. June 1952. 45p. diagrs., 5 tabs. (NACA TN 2729)

EFFECTS OF ASPECT RATIO ON AIR FLOW AT HIGH SUBSONIC MACH NUMBERS. W. F. Lindsey and Milton D. Humphreys. July 1952. 10p. photos., diagrs. (NACA TN 2720. Formerly NACA RM L8G23)

NUMERICAL DETERMINATION OF INDICIAL LIFT AND MOMENT FUNCTIONS FOR A TWO-DIMENSIONAL SINKING AND PITCHING AIRFOIL AT MACH NUMBERS 0.5 AND 0.6. Bernard Mazelsky and Joseph A. Drischler. July 1952. 37p. diagrs., 4 tabs. (NACA TN 2739)

THE EFFECT OF A SIMULATED PROPELLER SLIPSTREAM ON THE AERODYNAMIC CHARACTERISTICS OF AN UNSWEPT WING PANEL WITH AND WITHOUT NACELLES AT MACH NUMBERS FROM 0.30 TO 0.86. Gareth H. Jordan and Richard I. Cole. September 1952. 15p. diagrs., photo. (NACA TN 2776)

INVESTIGATION WITH AN INTERFEROMETER OF THE FLOW AROUND A CIRCULAR-ARC AIRFOIL AT MACH NUMBERS BETWEEN 0.6 AND 0.9. George P. Wood and Paul B. Gooderum. October 1952. 80p. diagrs., photos., tab. (NACA TN 2801)

*Mach Number Effects-Wing  
Sections (Cont.)*

EFFECTS OF INDEPENDENT VARIATIONS OF MACH NUMBER AND REYNOLDS NUMBER ON THE MAXIMUM LIFT COEFFICIENTS OF FOUR NACA 6-SERIES AIRFOIL SECTIONS. Stanley F. Racisz. November 1952. 32p. diagrs., 2 tabs. (NACA TN 2824)

A COMPARATIVE EXAMINATION OF SOME MEASUREMENTS OF AIRFOIL SECTION LIFT AND DRAG AT SUPERCRITICAL SPEEDS. Gerald E. Nitzberg and Stewart M. Crandall. November 1952. 30p. diagrs. (NACA TN 2825)

EXPERIMENTS ON TRANSONIC FLOW AROUND WEDGES. George P. Wood. November 1952. 34p. diagrs., photos., tab. (NACA TN 2829)

THEORETICAL STUDY OF THE TRANSONIC LIFT OF A DOUBLE-WEDGE PROFILE WITH DETACHED BOW WAVE. Walter G. Vincenti and Cleo B. Wagoner. (Portions of this work were reported at the eighth International Congress on Theoretical and Applied Mechanics, Istanbul, Turkey, August 20-28, 1952). December 1952. 63p. diagrs., 2 tabs. (NACA TN 2832)

AN APPLICATION OF THE METHOD OF CHARACTERISTICS TO TWO-DIMENSIONAL TRANSONIC FLOWS WITH DETACHED SHOCK WAVES. Keith C. Harder and E. B. Klunker. March 1953. 16p. diagrs. (NACA TN 2910)

PRESSURE DISTRIBUTIONS ABOUT FINITE WEDGES IN BOUNDED AND UNBOUNDED SUBSONIC STREAMS. Patrick L. Donoughe and Ernst I. Prasse. May 1953. 41p. diagrs., photos., 2 tabs. (NACA TN 2942)

WAKE  
(1.2.1.9)

EFFECTS OF COMPRESSIBILITY ON THE CHARACTERISTICS OF FIVE AIRFOILS. Bernard N. Daley. April 25, 1947. 73p. diagrs., photos., tab. (NACA RM L6L16) (Declassified from Restricted, 6/5/53)

EFFECT OF MACH NUMBER ON THE FLOW AND APPLICATION OF COMPRESSIBILITY CORRECTIONS IN A TWO-DIMENSIONAL SUBSONIC-TRANSONIC COMPRESSOR CASCADE HAVING VARIED POROUS-WALL SUCTION AT THE BLADE TIPS. William B. Briggs. March 1952. 43p. diagrs., photos. (NACA TN 2649)

COMPLETE WINGS  
(1.2.2)

PRELIMINARY INVESTIGATION OF DOWNWASH FLUCTUATIONS OF A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Antonio Ferri. August 28, 1946. 25p. diagrs. (NACA RM L6H28b) (Declassified from Restricted, 6/5/53)

INVESTIGATION OF DIVE BRAKES AND A DIVE-RECOVERY FLAP ON A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Axel T. Mattson. August 28, 1946. 118p. diagrs., photos., tab. (NACA RM L6H28c) (Declassified from Restricted, 6/5/53)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. II - THE EFFECT OF AIRFOIL SECTION MODIFICATIONS AND THE DETERMINATION OF THE WAKE DOWNWASH. Adrien E. Anderson. December 10, 1947. 78p. diagrs., photos., tab. (NACA RM A7H28) (Declassified from Restricted, 6/5/53)

PRELIMINARY INVESTIGATION AT LOW SPEEDS OF SWEPT WINGS IN YAWING FLOW. Alex Goodman and David Feigenbaum. February 4, 1948. 22p. diagrs., photo. (NACA RM L7I09) (Reclassified from Restricted, 7/3/51)

LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. I - THE EFFECT OF COMBINATION WITH A BODY OF REVOLUTION AND HEIGHT ABOVE A GROUND PLANE. Leonard M. Rose. August 27, 1948. 41p. diagrs., photos., 7 tabs. (NACA RM A7K03) (Declassified from Restricted, 6/11/53)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. III. CHARACTERISTICS OF WING WITH BODY AND VERTICAL TAIL. Adrien E. Anderson. October 14, 1949. 96p. diagrs., photos., 3 tabs. (NACA RM A9H04) (Declassified from Restricted, 6/11/53)

EXPERIMENTAL INVESTIGATION OF ROLLING PERFORMANCE OF STRAIGHT AND SWEPTBACK FLEXIBLE WINGS WITH VARIOUS AILERONS. Henry A. Cole, Jr. and Victor M. Ganzer, University of Washington. December 1951. 45p. diagrs., photos., 2 tabs. (NACA TN 2563)

WING THEORY  
(1.2.2.1)

A LIFT-CANCELLATION TECHNIQUE IN LINEARIZED SUPERSONIC-WING THEORY. Harold Mirels. 1951. ii, 11p. diagrs. (NACA Rept. 1004. Formerly TN 2145)

STUDY OF EFFECTS OF SWEEP ON THE FLUTTER OF CANTILEVER WINGS. J. G. Barmby, H. J. Cunningham and I. E. Garrick. 1951. ii, 25p. diagrs., photo., 7 tabs. (NACA Rept. 1014. Formerly TN 2121; RM L8H30)

COMPARISON BETWEEN THEORY AND EXPERIMENT FOR WINGS AT SUPERSONIC SPEEDS. Walter G. Vincenti. 1951. ii, 11p. diagrs., photos. (NACA Rept. 1033. Formerly TN 2100)

EQUATIONS AND CHARTS FOR THE RAPID ESTIMATION OF HINGE-MOMENT AND EFFECTIVENESS PARAMETERS FOR TRAILING-EDGE CONTROLS HAVING LEADING AND TRAILING EDGES SWEPT AHEAD OF THE MACH LINES. Kenneth L. Goin. 1951. ii, 71p. diagrs., 9 tabs. (NACA Rept. 1041. Formerly TN 2221)

**AERODYNAMICS**  
**34 WINGS (1.2)**

*Theory - Complete Wings (Cont.)*

FORMULAS FOR THE SUPERSONIC LOADING, LIFT AND DRAG OF FLAT SWEEP-BACK WINGS WITH LEADING EDGES BEHIND THE MACH LINES. Doris Cohen. 1951. iii, 40p. diagrs. (NACA Rept. 1050)

A SUMMARY OF LATERAL-STABILITY DERIVATIVES CALCULATED FOR WING PLAN FORMS IN SUPERSONIC FLOW. Arthur L. Jones and Alberta Alksne. 1951. ii, 35p. diagrs., 3 tabs. (NACA Rept. 1052)

INTEGRALS AND INTEGRAL EQUATIONS IN LINEARIZED WING THEORY. Harvard Lomax, Max A. Heaslet and Franklyn B. Fuller. 1951. ii, 34p. diagrs. (NACA Rept. 1054. Formerly TN 2252)

THEORETICAL ANTISYMMETRIC SPAN LOADING FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS. John DeYoung. 1951. 36p. diagrs., 9 tabs. (NACA Rept. 1056. Formerly TN 2140)

THREE-DIMENSIONAL UNSTEADY LIFT PROBLEMS IN HIGH-SPEED FLIGHT - THE TRIANGULAR WING. Harvard Lomax, Max A. Heaslet and Franklyn B. Fuller. June 1951. 62p. diagrs. (NACA TN 2387)

ANALYSIS OF PURE-BENDING FLUTTER OF A CANTILEVER SWEEP WING AND ITS RELATION TO BENDING-TORSION FLUTTER. H. J. Cunningham. September 1951. 24p. diagrs. (NACA TN 2461)

GENERALIZED CONICAL-FLOW FIELDS IN SUPERSONIC WING THEORY. Harvard Lomax and Max A. Heaslet. September 1951. 45p. diagrs. (NACA TN 2497)

THE AERODYNAMIC BEHAVIOR OF A HARMONICALLY OSCILLATING FINITE SWEEPBACK WING IN SUPERSONIC FLOW. Chieh-Chien Chang, Johns Hopkins University. October 1951. 76p. diagrs. (NACA TN 2467)

THE LINEARIZED CHARACTERISTICS METHOD AND ITS APPLICATION TO PRACTICAL NON-LINEAR SUPERSONIC PROBLEMS. Antonio Ferri. October 1951. 65p. diagrs. (NACA TN 2515)

PRESENT STATE OF DEVELOPMENT IN NON-STEADY MOTION OF A LIFTING SURFACE. (Lo stato attuale delle ricerche sul moto instazionario di una superficie portante). P. Cicala. October 1951. 96p. diagrs., 3 tabs. (NACA TM 1277. Trans. from *Aerotecnica*, v.21, no.9-10, Sept.-Oct.1941, p.557-591, 670-685, 759-773).

THEORETICAL AERODYNAMIC CHARACTERISTICS OF A FAMILY OF SLENDER WING-TAIL-BODY COMBINATIONS. Harvard Lomax and Paul F. Byrd. November 1951. 75p. diagrs., 2 tabs. (NACA TN 2554)

THEORETICAL SYMMETRIC SPAN LOADING DUE TO FLAP DEFLECTION FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS. John DeYoung. 1952. ii, 41p. diagrs., tabs. (NACA Rept. 1071. Formerly NACA TN 2278)

THEORETICAL DAMPING IN ROLL AND ROLLING MOMENT DUE TO DIFFERENTIAL WING INCIDENCE FOR SLENDER CRUCIFORM WINGS AND WING-BODY COMBINATIONS. Gaynor J. Adams and Duane W. Dugan. 1952. ii, 11p. diagrs. (NACA Rept. 1088. Extends analysis of TN 2270)

SOME REMARKS ON AN APPROXIMATE METHOD OF ESTIMATING THE WAVE DRAG DUE TO THICKNESS AT SUPERSONIC SPEEDS OF THREE-DIMENSIONAL WINGS WITH ARBITRARY PROFILE. Kenneth Margolis. February 1952. 9p. (NACA TN 2619)

SUPERSONIC CONICAL FLOW. Stephen H. Maslen, Brown University. March 1952. 32p. diagrs., tab. (NACA TN 2651)

GENERALIZED LINEARIZED CONICAL FLOW. W. D. Hayes, R. C. Roberts and N. Haaser, Brown University. March 1952. 48p. diagrs., tab. (NACA TN 2667)

RECIPROCITY RELATIONS IN AERODYNAMICS. Max A. Heaslet and John R. Spreiter. May 1952. 38p. diagrs. (NACA TN 2700)

A VECTOR STUDY OF LINEARIZED SUPERSONIC FLOW APPLICATIONS TO NONPLANAR PROBLEMS. John C. Martin. June 1952. 81p. diagrs., tab. (NACA TN 2641)

CALCULATION OF LIFT AND PITCHING MOMENTS DUE TO ANGLE OF ATTACK AND STEADY PITCHING VELOCITY AT SUPERSONIC SPEEDS FOR THIN SWEEPBACK TAPERED WINGS WITH STREAMWISE TIPS AND SUPERSONIC LEADING AND TRAILING EDGES. John C. Martin, Kenneth Margolis and Isabella Jeffreys. June 1952. 116p. diagrs., 9 tabs. (NACA TN 2699)

ON THE APPLICATION OF TRANSONIC SIMILARITY RULES. John R. Spreiter. June 1952. 45p. diagrs. (NACA TN 2726)

SPAN LOAD DISTRIBUTIONS RESULTING FROM ANGLE OF ATTACK, ROLLING, AND PITCHING FOR TAPERED SWEEPBACK WINGS WITH STREAMWISE TIPS. SUPERSONIC LEADING AND TRAILING EDGES. John C. Martin and Isabella Jeffreys. July 1952. 143p. diagrs., 6 tabs. (NACA TN 2643)

EFFECT OF A FINITE TRAILING-EDGE THICKNESS ON THE DRAG OF RECTANGULAR AND DELTA WINGS AT SUPERSONIC SPEEDS. E. B. Klunker and Conrad Rennemann, Jr. November 1952. 26p. diagrs. (NACA TN 2828)

SPAN LOAD DISTRIBUTIONS RESULTING FROM CONSTANT ANGLE OF ATTACK, STEADY ROLLING VELOCITY, STEADY PITCHING VELOCITY, AND CONSTANT VERTICAL ACCELERATION FOR TAPERED SWEEPBACK WINGS WITH STREAMWISE TIPS. SUBSONIC LEADING EDGES AND SUPERSONIC TRAILING EDGES. Margery E. Hannah and Kenneth Margolis. December 1952. 221p. diagrs., 4 tabs. (NACA TN 2831)

SUPERSONIC WAVE DRAG OF NONLIFTING DELTA WINGS WITH LINEARLY VARYING THICKNESS RATIO. Arthur Henderson, Jr. December 1952. 51p. diagrs. (NACA TN 2858)

*Theory - Complete Wings (Cont.)*

THEORETICAL CALCULATION OF THE PRESSURE DISTRIBUTION, SPAN LOADING, AND ROLLING MOMENT DUE TO SIDESLIP AT SUPERSONIC SPEEDS FOR THIN SWEPTBACK TAPERED WINGS WITH SUPERSONIC TRAILING EDGES AND WING TIPS PARALLEL TO THE AXIS OF WING SYMMETRY. Kenneth Margolis, Windsor L. Sherman and Margery E. Hannah. February 1953. 70p. diagrs., tab. (NACA TN 2898)

THE CALCULATION OF PRESSURE ON SLENDER AIRPLANES IN SUBSONIC AND SUPERSONIC FLOW. Max. A. Heaslet and Harvard Lomax. March 1953. 25p. diagrs. (NACA TN 2900)

DETERMINATION OF MEAN CAMBER SURFACES FOR WINGS HAVING UNIFORM CHORDWISE LOADING AND ARBITRARY SPANWISE LOADING IN SUBSONIC FLOW. S. Katzoff, M. Frances Faison and Hugh C. DuBose. May 1953. 43p. diagrs., tab. (NACA TN 2908)

METHOD FOR CALCULATING THE ROLLING AND YAWING MOMENTS DUE TO ROLLING FOR UNSWEPT WINGS WITH OR WITHOUT FLAPS ORAILERONS BY USE OF NONLINEAR SECTION LIFT DATA. Albert P. Martina. May 1953. 41p. diagrs., 11 tabs. (NACA TN 2937)

WING VARIABLES  
(1.2.2.2)

THE EFFECT OF BOUNDARY-LAYER CONTROL BY SUCTION AND OF SEVERAL HIGH-LIFT DEVICES ON THE AERODYNAMIC CHARACTERISTICS IN YAW OF A 47.5° SWEPTBACK WING-FUSELAGE COMBINATION. Jerome Pasamanick. October 28, 1948. 36p. diagrs., photo. (NACA RM L8E21) (Declassified from Restricted, 6/29/53)

COMPARISON BETWEEN THEORY AND EXPERIMENT FOR WINGS AT SUPERSONIC SPEEDS. Walter G. Vincenti. 1951. ii, 11p. diagrs., photos. (NACA Rept. 1033. Formerly TN 2100)

FORMULAS FOR THE SUPERSONIC LOADING, LIFT AND DRAG OF FLAT SWEPT-BACK WINGS WITH LEADING EDGES BEHIND THE MACH LINES. Doris Cohen. 1951. iii, 40p. diagrs. (NACA Rept. 1050)

WIND-TUNNEL INVESTIGATION AND ANALYSIS OF THE EFFECTS OF END PLATES ON THE AERODYNAMIC CHARACTERISTICS OF AN UNSWEPT WING. Donald R. Riley. August 1951. 55p. diagrs., photo., 2 tabs. (NACA TN 2440)

WIND-TUNNEL TESTS AT LOW SPEED OF SWEPT AND YAWED WINGS HAVING VARIOUS PLAN FORMS. Paul E. Purser and M. Leroy Spearman. December 1951. 82p. diagrs., photos., 2 tabs. (NACA TN 2445. Formerly RM L7D23)

ANALYSIS OF THE EFFECTS OF WING INTERFERENCE ON THE TAIL CONTRIBUTIONS TO THE ROLLING DERIVATIVES. William H. Michael, Jr. 1952. ii, 12p. diagrs. (NACA Rept. 1086. Formerly TN 2332)

SOME REMARKS ON AN APPROXIMATE METHOD OF ESTIMATING THE WAVE DRAG DUE TO THICKNESS AT SUPERSONIC SPEEDS OF THREE-DIMENSIONAL WINGS WITH ARBITRARY PROFILE. Kenneth Margolis. February 1952. 9p. (NACA TN 2619)

SOME EXPERIMENTS ON VISUALIZATION OF FLOW FIELDS BEHIND LOW-ASPECT-RATIO WINGS BY MEANS OF A TUFT GRID. John D. Bird and Donald R. Riley. May 1952. 32p. photos., diagrs., tab. (NACA TN 2674)

TRANSONIC SIMILARITY RULES FOR LIFTING WINGS. Keith C. Harder. June 1952. 26p. diagr. (NACA TN 2724)

A METHOD OF SELECTING THE THICKNESS, HOLLOWNESS, AND SIZE OF A SUPERSONIC WING FOR LEAST DRAG AND SUFFICIENT BENDING STRENGTH AT SPECIFIED FLIGHT CONDITIONS. James L. Amick. July 1952. 38p. diagrs. (NACA TN 2754)

Profiles  
(1.2.2.2.1)

PRELIMINARY TESTS AT TRANSONIC SPEEDS OF A MODEL OF A CONSTANT-CHORD WING WITH A SWEPTBACK OF 45° AND AN NACA 65<sub>(112)</sub>-210, a = 1.0 AIRFOIL SECTION. John A. Zalovick and Richard E. Adams. December 1945. 21p. diagrs., photos. (NACA ACR L5J16a) (Reclassified from Confidential, 7/3/51)

COMPARATIVE DRAG MEASUREMENTS AT TRANSONIC SPEEDS OF AN NACA 65-006 AIRFOIL AND A SYMMETRICAL CIRCULAR-ARC AIRFOIL. Jim Rogers Thompson and Bernard W. Marschner. March 6, 1947. 16p. diagrs., photo. (NACA RM L6J30) (Declassified from Confidential, 7/20/51)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. II - THE EFFECT OF AIRFOIL SECTION MODIFICATIONS AND THE DETERMINATION OF THE WAKE DOWNWASH. Adrien E. Anderson. December 10, 1947. 78p. diagrs., photos., tab. (NACA RM A7H28) (Declassified from Restricted, 6/5/53)

TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. I - THE EFFECT OF REYNOLDS NUMBER AND MACH NUMBER ON THE AERODYNAMIC CHARACTERISTICS OF THE WING WITH FLAP UNDEFLECTED. George G. Edwards and Jack D. Stephenson. January 22, 1948. 42p. diagrs., photos. (NACA RM A7K05) (Declassified from Restricted, 6/11/53)

LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. II - FLAPS. Leonard M. Rose. August 9, 1948. 17p. diagrs., photo. (NACA RM A7L11) (Declassified from Restricted, 6/11/53)

TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - THE EFFECTIVENESS AND HINGE MOMENTS OF A CONSTANT-CHORD PLAIN FLAP. Jack D. Stephenson and Arthur R. Amuendo. September 21, 1948. 82p. diagrs., photos., 9 tabs. (NACA RM A8E03) (Declassified from Restricted, 6/11/53)

AERODYNAMICS  
36 WINGS (1.2)

*Profiles - Complete Wings (Cont.)*

EFFECT OF AIRFOIL PROFILE OF SYMMETRICAL SECTIONS ON THE LOW-SPEED STATIC-STABILITY AND YAWING DERIVATIVES OF 45° SWEEPBACK WING MODELS OF ASPECT RATIO 2.61. William Letko and Byron M. Jaquet. November 9, 1948. 21p. diagrs., photo., tab. (NACA RM L8H10) (Declassified from Restricted, 3/10/52)

EFFECT OF AIRFOIL PROFILE OF SYMMETRICAL SECTIONS ON THE LOW-SPEED ROLLING DERIVATIVES OF 45° SWEEPBACK-WING MODELS OF ASPECT RATIO 2.61. William Letko and Jack D. Brewer. March 4, 1949. 27p. diagrs., photo., 2 tabs. (NACA RM L8L31a) (Declassified from Restricted, 3/10/52)

WIND-TUNNEL INVESTIGATION OF EFFECTS OF VARIOUS AERODYNAMIC BALANCE SHAPES AND SWEEPBACK ON CONTROL-SURFACE CHARACTERISTICS OF SEMISPAN TAIL SURFACES WITH NACA 0009, 0015, 66-009, 66(215)-014, AND CIRCULAR-ARC AIRFOIL SECTIONS. John J. Harper, Georgia Institute of Technology. October 1951. 127p. diagrs., photos., 5 tabs. (NACA TN 2495)

EXPERIMENTAL INVESTIGATION OF BASE PRESSURE ON BLUNT-TRAILING-EDGE WINGS AT SUPERSONIC VELOCITIES. Dean R. Chapman, William R. Wimbrow and Robert H. Kester. January 1952. 53p. diagrs., photos., tab. (NACA TN 2611)

SOME REMARKS ON AN APPROXIMATE METHOD OF ESTIMATING THE WAVE DRAG DUE TO THICKNESS AT SUPERSONIC SPEEDS OF THREE-DIMENSIONAL WINGS WITH ARBITRARY PROFILE. Kenneth Margolis. February 1952. 9p. (NACA TN 2619)

TRANSONIC SIMILARITY RULES FOR LIFTING WINGS. Keith C. Harder. June 1952. 26p. diagr. (NACA TN 2724)

LANGLEY FULL-SCALE-TUNNEL INVESTIGATION OF THE MAXIMUM-LIFT AND STALLING CHARACTERISTICS OF A TRAPEZOIDAL WING OF ASPECT RATIO 4 WITH CIRCULAR-ARC AIRFOIL SECTIONS. Roy H. Lange. November 1952. 24p. diagrs., photos. (NACA TN 2823. Formerly RM L7H19)

EFFECT OF A FINITE TRAILING-EDGE THICKNESS ON THE DRAG OF RECTANGULAR AND DELTA WINGS AT SUPERSONIC SPEEDS. E. B. Klunker and Conrad Rennemann, Jr. November 1952. 26p. diagrs. (NACA TN 2828)

DETERMINATION OF MEAN CAMBER SURFACES FOR WINGS HAVING UNIFORM CHORDWISE LOADING AND ARBITRARY SPANWISE LOADING IN SUBSONIC FLOW. S. Katzoff, M. Frances Faison and Hugh C. DuBose. May 1953. 43p. diagrs., tab. (NACA TN 2908)

Aspect Ratio  
(1.2.2.2.2)

National Advisory Committee for Aeronautics. FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS. Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diagrs., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

WIND-TUNNEL INVESTIGATION AT LOW SPEEDS OF THE PITCHING DERIVATIVES OF UNTAPERED SWEEP WINGS. Robert MacLachlan and Lewis R. Fisher. September 29, 1948. 22p. diagrs., photo., tab. (NACA RM L8G19) (Declassified from Restricted, 3/10/52)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

EFFECT OF ASPECT RATIO ON THE AIR FORCES AND MOMENTS OF HARMONICALLY OSCILLATING THIN RECTANGULAR WINGS IN SUPERSONIC POTENTIAL FLOW. Charles E. Watkins. 1951. 17p. diagrs. (NACA Rept. 1028. Formerly NACA TN 2064)

A SUMMARY OF LATERAL-STABILITY DERIVATIVES CALCULATED FOR WING PLAN FORMS IN SUPERSONIC FLOW. Arthur L. Jones and Alberta Alksne. 1951. ii, 35p. diagrs., 3 tabs. (NACA Rept. 1052)

THEORETICAL ANTISYMMETRIC SPAN LOADING FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS. John DeYoung. 1951. 36p. diagrs., 9 tabs. (NACA Rept. 1056. Formerly TN 2140)

ANALYSIS OF THE EFFECTS OF BOUNDARY-LAYER CONTROL ON THE TAKE-OFF AND POWER-OFF LANDING PERFORMANCE CHARACTERISTICS OF A LIAISON TYPE OF AIRPLANE. Elmer A. Horton, Laurence K. Loftin, Jr., Stanley F. Racisz and John H. Quinn, Jr. 1951. ii, 31p. diagrs. (NACA Rept. 1057. Formerly TN 1597; TN 2143)

INVESTIGATION OF NACA 64,2-432 AND 64,3-440 AIRFOIL SECTIONS WITH BOUNDARY-LAYER CONTROL AND AN ANALYTICAL STUDY OF THEIR POSSIBLE APPLICATIONS. Elmer A. Horton, Stanley F. Racisz and Nicholas J. Paradiso. July 1951. 40p. diagrs., photos., 2 tabs. (NACA TN 2405)

PRESENT STATE OF DEVELOPMENT IN NON-STEADY MOTION OF A LIFTING SURFACE. (Lo stato attuale delle ricerche sul moto instazionario di una superficie portante). P. Cicala. October 1951. 96p. diagrs., 3 tabs. (NACA TM 1277. Trans. from Aerotecnica, v.21, no.9-10, Sept.-Oct.1941, p.557-591, 670-685, 759-773).

STABILITY AND CONTROL CHARACTERISTICS OF A COMPLETE AIRPLANE MODEL HAVING A WING WITH QUARTER-CHORD LINE SWEEP BACK 40°, ASPECT RATIO 2.50, AND TAPER RATIO 0.42. Marvin Schuderfrei, Paul Comisarow and Kenneth W. Goodson. December 1951. 86p. photos., diagrs. (NACA TN 2482. Formerly RM L7B25)

THEORETICAL SYMMETRIC SPAN LOADING DUE TO FLAP DEFLECTION FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS. John DeYoung. 1952. ii, 41p. diagrs., tabs. (NACA Rept. 1071. Formerly NACA TN 2278)

*Aspect Ratio - Complete Wings (Cont.)*

EFFECTS OF FINITE SPAN ON THE SECTION CHARACTERISTICS OF TWO 45° SWEEP-BACK WINGS OF ASPECT RATIO 6. Lynn W. Hunton. March 17, 1952. 34p. diagrs. (NACA RM A52A10) (Declassified from Restricted, 4/10/53)

SOME EFFECTS OF FREQUENCY ON THE CONTRIBUTION OF A VERTICAL TAIL TO THE FREE AERODYNAMIC DAMPING OF A MODEL OSCILLATING IN YAW. John D. Bird, Lewis R. Fisher and Sadie M. Hubbard. April 1952. 39p. diagrs., photo., tab. (NACA TN 2657)

CALCULATION OF LIFT AND PITCHING MOMENTS DUE TO ANGLE OF ATTACK AND STEADY PITCHING VELOCITY AT SUPERSONIC SPEEDS FOR THIN SWEEPBACK TAPERED WINGS WITH STREAMWISE TIPS AND SUPERSONIC LEADING AND TRAILING EDGES. John C. Martin, Kenneth Margolis and Isabella Jeffreys. June 1952. 116p. diagrs., 9 tabs. (NACA TN 2699)

TRANSONIC SIMILARITY RULES FOR LIFTING WINGS. Keith C. Harder. June 1952. 26p. diagr. (NACA TN 2724)

SPAN LOAD DISTRIBUTIONS RESULTING FROM ANGLE OF ATTACK, ROLLING, AND PITCHING FOR TAPERED SWEEPBACK WINGS WITH STREAMWISE TIPS. SUPERSONIC LEADING AND TRAILING EDGES. John C. Martin and Isabella Jeffreys. July 1952. 143p. diagrs., 6 tabs. (NACA TN 2643)

EFFECTS OF ASPECT RATIO ON AIR FLOW AT HIGH SUBSONIC MACH NUMBERS. W. F. Lindsey and Milton D. Humphreys. July 1952. 10p. photos., diagrs. (NACA TN 2720. Formerly NACA RM L8G23)

A SIMPLE APPROXIMATE METHOD FOR CALCULATING SPANWISE LIFT DISTRIBUTIONS AND AERODYNAMIC INFLUENCE COEFFICIENTS AT SUBSONIC SPEEDS. Franklin W. Diederich. August 1952. 63p. diagrs., tab. (NACA TN 2751)

FLOW STUDIES IN THE VICINITY OF A MODIFIED FLAT-PLATE RECTANGULAR WING OF ASPECT RATIO 0.25. William H. Michael, Jr. September 1952. 33p. diagrs., photos. (NACA TN 2790)

INVESTIGATION OF THE EFFECTS OF VARIATIONS IN THE REYNOLDS NUMBER BETWEEN  $0.4 \times 10^6$  AND  $3.0 \times 10^6$  ON THE LOW-SPEED AERODYNAMIC CHARACTERISTICS OF THREE LOW-ASPECT-RATIO SYMMETRICAL WINGS WITH RECTANGULAR PLAN FORMS. George W. Jones, Jr. September 1952. 13p. diagrs. (NACA RM L52G18)

SPAN LOAD DISTRIBUTIONS RESULTING FROM CONSTANT ANGLE OF ATTACK, STEADY ROLLING VELOCITY, STEADY PITCHING VELOCITY, AND CONSTANT VERTICAL ACCELERATION FOR TAPERED SWEEPBACK WINGS WITH STREAMWISE TIPS. SUBSONIC LEADING EDGES AND SUPERSONIC TRAILING EDGES. Margery E. Hannah and Kenneth Margolis. December 1952. 221p. diagrs., 4 tabs. (NACA TN 2831)

STEADY VIBRATIONS OF WING OF CIRCULAR PLAN FORM. (Ob ustanovivshikhsya kolebaniyakh kryla krugovoi formy v plane). THEORY OF WING OF CIRCULAR PLAN FORM. (Teoriya kryla konechnogo razmakha krugovoi formy v plane). N. E. Kochin. January 1953. 93p. diagrs. (NACA TM 1324. Trans. from: Prikladnaya Matematika i Mekhanika, v. 6, no. 4, 1942, p. 287-316; Prikladnaya Matematika i Mekhanika, v. 4, no. 1, 1940, p. 3-32).

THEORETICAL CALCULATION OF THE PRESSURE DISTRIBUTION, SPAN LOADING, AND ROLLING MOMENT DUE TO SIDESLIP AT SUPERSONIC SPEEDS FOR THIN SWEEPBACK TAPERED WINGS WITH SUPERSONIC TRAILING EDGES AND WING TIPS PARALLEL TO THE AXIS OF WING SYMMETRY. Kenneth Margolis, Windsor L. Sherman and Margery E. Hannah. February 1953. 70p. diagrs., tab. (NACA TN 2898)

AN ANALYSIS OF THE FACTORS AFFECTING THE LOSS IN LIFT AND SHIFT IN AERODYNAMIC CENTER PRODUCED BY THE DISTORTION OF A SWEEP WING UNDER AERODYNAMIC LOAD. Charles W. Mathews and Max C. Kurbjun. March 1953. 65p. diagrs. (NACA TN 2901)

Sweep  
(1.2.2.2.3)

PRELIMINARY TESTS AT TRANSONIC SPEEDS OF A MODEL OF A CONSTANT-CHORD WING WITH A SWEEPBACK OF 45° AND AN NACA 65<sub>(112)</sub>-210,  $a = 1.0$  AIRFOIL SECTION. John A. Zalovick and Richard E. Adams. December 1945. 21p. diagrs., photos. (NACA ACR L5J16a) (Reclassified from Confidential, 7/3/51)

THE EFFECTIVENESS OF A TRAILING-EDGE SPOILER ON A SWEEP-BACK AIRFOIL AT TRANSONIC SPEEDS FROM TESTS BY THE NACA WING-FLOW METHOD. Norman S. Silsby and Fred L. Daum. January 20, 1947. 13p. diagrs., photo. (NACA RM L6K12a) (Reclassified from Confidential, 7/3/51)

SUMMARY OF AVAILABLE DATA RELATING TO REYNOLDS NUMBER EFFECTS ON THE MAXIMUM LIFT COEFFICIENTS OF SWEEP-BACK WINGS. Harold H. Sweberg and Roy H. Lange. March 4, 1947. 20p. diagrs., tab. (NACA RM L6L20a) (Declassified from Restricted, 2/28/52)

PRELIMINARY INVESTIGATION AT LOW SPEEDS OF SWEEP WINGS IN ROLLING FLOW. David Feigenbaum and Alex Goodman. May 22, 1947. 29p. diagrs., photo. (NACA RM L7E09) (Reclassified from Restricted, 6/27/51)

AN INVESTIGATION OF THE LOW-SPEED STABILITY AND CONTROL CHARACTERISTICS OF SWEEP-FORWARD AND SWEEP-BACK WINGS IN THE AMES 40- BY 80-FOOT WIND TUNNEL. Gerald M. McCormack and Victor I. Stevens, Jr. June 10, 1947. 172p. diagrs., photos., 2 tabs. (NACA RM A6K15) (Reclassified from Restricted, 7/3/51)

MEASUREMENTS OF THE DAMPING IN ROLL OF LARGE-SCALE SWEEP-FORWARD AND SWEEP-BACK WINGS. Lynn W. Hunton and Joseph K. Dew. July 30, 1947. 39p. diagrs., photos., 2 tabs. (NACA RM A7D11) (Declassified from Restricted 6/5/53)

AERODYNAMICS  
38 WINGS (1.2)

*Sweep - Complete Wings (Cont.)*

**INVESTIGATION OF HIGH-LIFT AND STALL-CONTROL DEVICES ON AN NACA 64-SERIES 42° SWEEPBACK WING WITH AND WITHOUT FUSELAGE.** Robert R. Graham and D. William Conner. October 14, 1947. 47p. diagrs., photos., 2 tabs. (NACA RM L7G09) (Declassified from Restricted, 6/25/53)

**AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. I - CHARACTERISTICS OF A WING HAVING A DOUBLE-WEDGE AIRFOIL SECTION WITH MAXIMUM THICKNESS AT 20-PERCENT CHORD.** Adrien E. Anderson. November 13, 1947. 59p. diagrs., photos., tab. (NACA RM A7F06) (Declassified from Restricted, 6/5/53)

**AN INVESTIGATION OF THE EFFECT OF TIP SHAPE ON THE LOW-SPEED AERODYNAMIC CHARACTERISTICS OF LARGE-SCALE SWEEP WINGS.** Walter C. Walling. November 13, 1947. 18p. diagrs., photos. (NACA RM A7H13) (Reclassified from Restricted, 7/3/51)

**FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS.** Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diagrs., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

**AN INVESTIGATION OF THE DOWNWASH AND WAKE BEHIND LARGE-SCALE SWEEP AND UNSWEEP WINGS.** William H. Tolhurst, Jr. February 2, 1948. 25p. diagrs., photo. (NACA RM A7L05) (Declassified from Restricted, 6/11/53)

**PRELIMINARY INVESTIGATION AT LOW SPEEDS OF SWEEP WINGS IN YAWING FLOW.** Alex Goodman and David Feigenbaum. February 4, 1948. 22p. diagrs., photo. (NACA RM L7I09) (Reclassified from Restricted, 7/3/51)

**FLUTTER INVESTIGATION IN THE TRANSONIC RANGE OF SIX AIRFOILS ATTACHED TO THREE FREELY FALLING BODIES.** S. A. Clevenson and William T. Lauten, Jr. May 6, 1948. 32p. diagrs., photos., 2 tabs. (NACA RM L7K17) (Declassified from Restricted, 6/11/53)

**INITIAL FLIGHT TEST OF THE NACA FR-1-A, A LOW-ACCELERATION ROCKET-PROPELLED VEHICLE FOR TRANSONIC FLUTTER RESEARCH.** Ellwyn E. Angle. 25p. diagrs., photos. June 29, 1948. (NACA RM L7J08) (Declassified from Restricted, 6/11/53)

**FLIGHT TEST OF NACA FR-1-B, A LOW-ACCELERATION ROCKET-PROPELLED VEHICLE FOR TRANSONIC FLUTTER RESEARCH.** Ellwyn E. Angle, Sherman A. Clevenson and Reginald R. Lundstrom. July 20, 1948. 22p. diagrs., photos., 3 tabs. (NACA RM L8C24) (Declassified from Restricted, 6/11/53)

**LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. III - STATIC STABILITY WITH TWIN VERTICAL FINS.** Leonard M. Rose. August 24, 1948. 11p. diagrs. (NACA RM A8C03) (Declassified from Restricted, 6/11/53)

**WIND-TUNNEL INVESTIGATION OF HIGH-LIFT AND STALL-CONTROL DEVICES ON A 37° SWEEPBACK WING OF ASPECT RATIO 6 AT HIGH REYNOLDS NUMBERS.** William Koven and Robert R. Graham. September 2, 1948. 70p. diagrs., photos., tab. (NACA RM L8D29) (Declassified from Restricted, 6/29/53)

**WIND-TUNNEL INVESTIGATION AT LOW SPEEDS OF THE PITCHING DERIVATIVES OF UNTAPERED SWEEP WINGS.** Robert MacLachlan and Lewis R. Fisher. September 29, 1948. 22p. diagrs., photo., tab. (NACA RM L8G19) (Declassified from Restricted, 3/10/52)

**EFFECT OF AIRFOIL PROFILE OF SYMMETRICAL SECTIONS ON THE LOW-SPEED STATIC-STABILITY AND YAWING DERIVATIVES OF 45° SWEEPBACK WING MODELS OF ASPECT RATIO 2.61.** William Letko and Byron M. Jaquet. November 9, 1948. 21p. diagrs., photo., tab. (NACA RM L8H10) (Declassified from Restricted, 3/10/52)

**THE EFFECT OF NEGATIVE DIHEDRAL, TIP DROOP, AND WING-TIP SHAPE ON THE LOW-SPEED AERODYNAMIC CHARACTERISTICS OF A COMPLETE MODEL HAVING A 45° SWEEPBACK WING.** M. Leroy Spearman and Robert E. Becht. December 6, 1948. 50p. diagrs., photo., tab. (NACA RM L8J07) (Declassified from Restricted, 3/10/52)

**PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL.** Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

**CHORDWISE AND SPANWISE LOADINGS MEASURED AT LOW SPEED ON LARGE TRIANGULAR WINGS.** Adrien E. Anderson. April 19, 1949. 78p. diagrs., photos., 2 tabs. (NACA RM A9B17) (Declassified from Restricted, 6/11/53)

**EFFECTS OF SEVERAL LEADING-EDGE MODIFICATIONS ON THE STALLING CHARACTERISTICS OF A 45° SWEEP-FORWARD WING.** Gerald M. McCormack and Woodrow L. Cook. June 14, 1949. 46p. diagrs., photo., tab. (NACA RM A9D29) (Reclassified from Restricted, 7/3/51)

**INVESTIGATION AT LARGE SCALE OF THE PRESSURE DISTRIBUTION AND FLOW PHENOMENA OVER A WING WITH THE LEADING EDGE SWEEP BACK 47.5° HAVING CIRCULAR-ARC AIRFOIL SECTIONS AND EQUIPPED WITH DROOPED-NOSE AND PLAIN FLAPS.** Roy H. Lange, Edward F. Whittle, Jr. and Marvin P. Fink. September 8, 1949. 72p. diagrs., 3 tabs. (NACA RM L9G15) (Declassified from Restricted, 6/29/53)

**TESTS OF A MODEL HORIZONTAL TAIL OF ASPECT RATIO 4.5 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. I - QUARTER-CHORD LINE SWEEP BACK 35°.** Bruce E. Tinling and Jerald K. Dickson. September 9, 1949. 118p. diagrs., photo., tab. (NACA RM A9G13) (Declassified from Restricted, 6/11/53)

**AERODYNAMIC CHARACTERISTICS OF AN AIRFOIL-FOREBODY SWEEP FLYING-BOAT HULL WITH A WING AND TAIL SWEEP BACK 51.3° AT THE LEADING EDGE.** Rodger L. Naeseth and Richard G. MacLeod. September 9, 1949. 27p. diagrs., photo., tab. (NACA RM L9F08) (Declassified from Confidential, 6/11/53)

**TESTS OF A MODEL HORIZONTAL TAIL OF ASPECT RATIO 4.5 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - ELEVATOR HINGE LINE NORMAL TO THE PLANE OF SYMMETRY.** Bruce E. Tinling and Jerald K. Dickson. October 17, 1949. 106p. diagrs., photo., tabs. (NACA RM A9H11a) (Declassified from Restricted, 6/11/53)

*Sweep - Complete Wings (Cont.)*

EFFECTS OF BOUNDARY-LAYER CONTROL ON THE LONGITUDINAL CHARACTERISTICS OF A 45° SWEEP-FORWARD WING-FUSELAGE COMBINATION. Gerald M. McCormack and Woodrow L. Cook. February 2, 1950. 73p. diagrs., photo., 2 tabs. (NACA RM A9K02a) (Declassified from Restricted, 6/29/53)

STUDY OF EFFECTS OF SWEEP ON THE FLUTTER OF CANTILEVER WINGS. J. G. Barmby, H. J. Cunningham and I. E. Garrick. 1951. ii, 25p. diagrs., photo., 7 tabs. (NACA Rept. 1014. Formerly TN 2121; RM L8H30)

FORMULAS FOR THE SUPERSONIC LOADING, LIFT AND DRAG OF FLAT SWEEP-BACK WINGS WITH LEADING EDGES BEHIND THE MACH LINES. Doris Cohen. 1951. iii, 40p. diagrs. (NACA Rept. 1050)

A SUMMARY OF LATERAL-STABILITY DERIVATIVES CALCULATED FOR WING PLAN FORMS IN SUPERSONIC FLOW. Arthur L. Jones and Alberta Alksne. 1951. ii, 35p. diagrs., 3 tabs. (NACA Rept. 1052)

THEORETICAL ANTISYMMETRIC SPAN LOADING FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS. John DeYoung. 1951. 36p. diagrs., 9 tabs. (NACA Rept. 1056. Formerly TN 2140)

EFFECT OF HORIZONTAL-TAIL LOCATION ON LOW-SPEED STATIC LONGITUDINAL STABILITY AND DAMPING IN PITCH OF A MODEL HAVING 45° SWEEPBACK WING AND TAIL SURFACES. Jacob H. Lichtenstein. June 1951. 26p. diagrs., photo., 3 tabs. (NACA TN 2381)

EFFECT OF HORIZONTAL-TAIL SIZE AND TAIL LENGTH ON LOW-SPEED STATIC LONGITUDINAL STABILITY AND DAMPING IN PITCH OF A MODEL HAVING 45° SWEEPBACK WING AND TAIL SURFACES. Jacob H. Lichtenstein. June 1951. 32p. diagrs., photo., 3 tabs. (NACA TN 2382)

THREE-DIMENSIONAL UNSTEADY LIFT PROBLEMS IN HIGH-SPEED FLIGHT - THE TRIANGULAR WING. Harvard Lomax, Max A. Heaslet and Franklyn B. Fuller. June 1951. 62p. diagrs. (NACA TN 2387)

AIR FORCES AND MOMENTS ON TRIANGULAR AND RELATED WINGS WITH SUBSONIC LEADING EDGES OSCILLATING IN SUPERSONIC POTENTIAL FLOW. Charles E. Watkins. September 1951. 44p. diagrs. (NACA TN 2457)

ANALYSIS OF PURE-BENDING FLUTTER OF A CANTILEVER SWEEP WING AND ITS RELATION TO BENDING-TORSION FLUTTER. H. J. Cunningham. September 1951. 24p. diagrs. (NACA TN 2461)

LIFT AND MOMENT ON OSCILLATING TRIANGULAR AND RELATED WINGS WITH SUPERSONIC EDGES. Herbert C. Nelson. September 1951. 34p. diagrs. (NACA TN 2494)

GENERALIZED CONICAL-FLOW FIELDS IN SUPERSONIC WING THEORY. Harvard Lomax and Max A. Heaslet. September 1951. 45p. diagrs. (NACA TN 2497)

A COMPARISON OF THE TURBULENT BOUNDARY-LAYER GROWTH ON AN UNSWEPT AND A SWEEP WING. John M. Altman and Nora-Lee F. Hayter. September 1951. 30p. diagrs., photos. (NACA TN 2500)

THE AERODYNAMIC BEHAVIOR OF A HARMONICALLY OSCILLATING FINITE SWEEPBACK WING IN SUPERSONIC FLOW. Chieh-Chien Chang, Johns Hopkins University. October 1951. 76p. diagrs. (NACA TN 2467)

INVESTIGATION AT LOW SPEED OF 45° AND 60° SWEEPBACK, TAPERED, LOW-DRAG WINGS EQUIPPED WITH VARIOUS TYPES OF FULL-SPAN, TRAILING-EDGE FLAPS. John J. Harper, Georgia Institute of Technology. October 1951. 53p. diagrs., photos., 3 tabs. (NACA TN 2468)

EFFECT OF FUSELAGE AND TAIL SURFACES ON LOW-SPEED YAWING CHARACTERISTICS OF A SWEEP-WING MODEL AS DETERMINED IN CURVED-FLOW TEST SECTION OF LANGLEY STABILITY TUNNEL. John D. Bird, Byron M. Jaquet and John W. Cowan. October 1951. 19p. diagrs., photo. (NACA TN 2483. Formerly RM L8G13)

EFFECT OF GROUND INTERFERENCE ON THE AERODYNAMIC CHARACTERISTICS OF A 42° SWEEPBACK WING. G. Chester Furlong and Thomas V. Bollech. October 1951. 24p. diagrs., photos. (NACA TN 2487. Formerly RM L8F04)

WIND-TUNNEL INVESTIGATION OF EFFECTS OF VARIOUS AERODYNAMIC BALANCE SHAPES AND SWEEPBACK ON CONTROL-SURFACE CHARACTERISTICS OF SEMISPAN TAIL SURFACES WITH NACA 0009, 0015, 66-009, 66(215)-014, AND CIRCULAR-ARC AIRFOIL SECTIONS. John J. Harper, Georgia Institute of Technology. October 1951. 127p. diagrs., photos., 5 tabs. (NACA TN 2495)

EFFECTS OF WING POSITION AND HORIZONTAL-TAIL POSITION ON THE STATIC STABILITY CHARACTERISTICS OF MODELS WITH UNSWEPT AND 45° SWEEPBACK SURFACES WITH SOME REFERENCE TO MUTUAL INTERFERENCE. Alex Goodman. October 1951. 58p. diagrs., photos., 4 tabs. (NACA TN 2504)

EXPERIMENTAL INVESTIGATION OF THE LOW-SPEED STATIC AND YAWING STABILITY CHARACTERISTICS OF A 45° SWEEPBACK HIGH-WING CONFIGURATION WITH VARIOUS TWIN VERTICAL WING FINS. Alex Goodman and Walter D. Wolhart. November 1951. 25p. diagrs., photos., 3 tabs. (NACA TN 2534)

THEORETICAL AERODYNAMIC CHARACTERISTICS OF A FAMILY OF SLENDER WING-TAIL-BODY COMBINATIONS. Harvard Lomax and Paul F. Byrd. November 1951. 75p. diagrs., 2 tabs. (NACA TN 2554)

EFFECT OF TAPER RATIO ON THE LOW-SPEED ROLLING STABILITY DERIVATIVES OF SWEEP AND UNSWEPT WINGS OF ASPECT RATIO 2.61. Jack D. Brewer and Lewis R. Fisher. November 1951. 17p. diagrs., photo. (NACA TN 2555. Formerly RM L8H18)



AERODYNAMICS  
40 WINGS (1.2)

*Sweep - Complete Wings (Cont.)*

INVESTIGATIONS ON WINGS WITH AND WITHOUT SWEEPBACK AT HIGH SUBSONIC SPEEDS. (Untersuchungen an gepfeilten und ungepfeilten Flügeln bei hohen Unterschallgeschwindigkeiten). Jakob Ackeret, Max Degen and Nikolaus Rott. November 1951. 14p. diags., photos. (NACA TM 1320. Trans. from Zeitschrift für angewandte Mathematik und Physik, v.1, 1950, p.32-42).

WIND-TUNNEL TESTS AT LOW SPEED OF SWEEP AND YAWED WINGS HAVING VARIOUS PLAN FORMS. Paul E. Purser and M. Leroy Spearman. December 1951. 82p. diags., photos., 2 tabs. (NACA TN 2445. Formerly RM L7D23)

STABILITY AND CONTROL CHARACTERISTICS OF A COMPLETE AIRPLANE MODEL HAVING A WING WITH QUARTER-CHORD LINE SWEEP BACK  $40^\circ$ , ASPECT RATIO 2.50, AND TAPER RATIO 0.42. Marvin Schulderfrei, Paul Comisarow and Kenneth W. Goodson. December 1951. 86p. photos., diags. (NACA TN 2482. Formerly RM L7B25)

EXPERIMENTAL INVESTIGATION OF ROLLING PERFORMANCE OF STRAIGHT AND SWEEPBACK FLEXIBLE WINGS WITH VARIOUS AILERONS. Henry A. Cole, Jr. and Victor M. Ganzer, University of Washington. December 1951. 45p. diags., photos., 2 tabs. (NACA TN 2563)

INFLUENCE OF WING AND FUSELAGE ON THE VERTICAL-TAIL CONTRIBUTION TO THE LOW-SPEED ROLLING DERIVATIVES OF MIDWING AIRPLANE MODELS WITH  $45^\circ$  SWEEPBACK SURFACES. Walter D. Wolhart. December 1951. 55p. diags., photo., 3 tabs. (NACA TN 2587)

THEORETICAL SYMMETRIC SPAN LOADING DUE TO FLAP DEFLECTION FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS. John DeYoung. 1952. ii, 41p. diags., tabs. (NACA Rept. 1071. Formerly NACA TN 2278)

GENERALIZED LINEARIZED CONICAL FLOW. W. D. Hayes, R. C. Roberts and N. Haaser, Brown University. March 1952. 48p. diags., tab. (NACA TN 2667)

EFFECTS OF FINITE SPAN ON THE SECTION CHARACTERISTICS OF TWO  $45^\circ$  SWEEP-BACK WINGS OF ASPECT RATIO 6. Lynn W. Hutton. March 17, 1952. 34p. diags. (NACA RM A52A10) (Declassified from Restricted, 4/10/53)

GUST-TUNNEL INVESTIGATION OF DELTA-WING MODEL WITH THE LEADING EDGE SWEEP BACK  $60^\circ$ . Harold B. Pierce and Slaton L. Johns. April 1952. 12p. diags., photo., 3 tabs. (NACA RM L52B04)

INVESTIGATIONS OF THE BOUNDARY-LAYER CONTROL OF A FULL SCALE SWEEP WING WITH AIR BLEED OFF FROM THE TURBOJET. (Recherches sur l'Hypersustentation d'une Aile en Fleche Reelle par Controle de la Couche Limite Utilisant le Prelevement d'Air sur le Turbo-Reacteur). P. Rebuffet and Ph Poisson-Quinton. April 1952. 43p. diags., photos. (NACA TM 1331. Trans. from Recherche Aéronautique, no.14, March-April, 1950, p.39-54)

EFFECT OF HIGH-LIFT DEVICES ON THE LOW-SPEED STATIC LATERAL AND YAWING STABILITY CHARACTERISTICS OF AN UNTAPERED  $45^\circ$  SWEEPBACK WING. Jacob H. Lichtenstein. May 1952. 20p. diags., photo. (NACA TN 2689. Formerly RM L8G20)

CALCULATION OF LIFT AND PITCHING MOMENTS DUE TO ANGLE OF ATTACK AND STEADY PITCHING VELOCITY AT SUPERSONIC SPEEDS FOR THIN SWEEPBACK TAPERED WINGS WITH STREAMWISE TIPS AND SUPERSONIC LEADING AND TRAILING EDGES. John C. Martin, Kenneth Margolis and Isabella Jeffreys. June 1952. 116p. diags., 9 tabs. (NACA TN 2699)

TRANSONIC SIMILARITY RULES FOR LIFTING WINGS. Keith C. Harder. June 1952. 26p. diagr. (NACA TN 2724)

SPAN LOAD DISTRIBUTIONS RESULTING FROM ANGLE OF ATTACK, ROLLING, AND PITCHING FOR TAPERED SWEEPBACK WINGS WITH STREAMWISE TIPS. SUPERSONIC LEADING AND TRAILING EDGES. John C. Martin and Isabella Jeffreys. July 1952. 143p. diags., 6 tabs. (NACA TN 2643)

INVESTIGATION OF THE INFLUENCE OF FUSELAGE AND TAIL SURFACES ON LOW-SPEED STATIC STABILITY AND ROLLING CHARACTERISTICS OF A SWEEP-WING MODEL. John D. Bird, Jacob H. Lichtenstein and Byron M. Jaquet. July 1952. 18p. diags., photo. (NACA TN 2741. Formerly RM L7H15)

A SIMPLE APPROXIMATE METHOD FOR CALCULATING SPANWISE LIFT DISTRIBUTIONS AND AERODYNAMIC INFLUENCE COEFFICIENTS AT SUBSONIC SPEEDS. Franklin W. Diederich. August 1952. 63p. diags., tab. (NACA TN 2751)

EFFECT OF HIGH-LIFT DEVICES ON THE STATIC-LATERAL-STABILITY DERIVATIVES OF A  $45^\circ$  SWEEPBACK WING OF ASPECT RATIO 4.0 AND TAPER RATIO 0.6 IN COMBINATION WITH A BODY. Jacob H. Lichtenstein and James L. Williams. November 1952. 50p. diags., photos., 5 tabs. (NACA TN 2819)

SPAN LOAD DISTRIBUTIONS RESULTING FROM CONSTANT ANGLE OF ATTACK, STEADY ROLLING VELOCITY, STEADY PITCHING VELOCITY, AND CONSTANT VERTICAL ACCELERATION FOR TAPERED SWEEPBACK WINGS WITH STREAMWISE TIPS. SUBSONIC LEADING EDGES AND SUPERSONIC TRAILING EDGES. Margery E. Hannah and Kenneth Margolis. December 1952. 221p. diags., 4 tabs. (NACA TN 2831)

THEORETICAL CALCULATION OF THE PRESSURE DISTRIBUTION, SPAN LOADING, AND ROLLING MOMENT DUE TO SIDESLIP AT SUPERSONIC SPEEDS FOR THIN SWEEPBACK TAPERED WINGS WITH SUPERSONIC TRAILING EDGES AND WING TIPS PARALLEL TO THE AXIS OF WING SYMMETRY. Kenneth Margolis, Windsor L. Sherman and Margery E. Hannah. February 1953. 70p. diags., tab. (NACA TN 2898)

THE CALCULATION OF PRESSURE ON SLENDER AIRPLANES IN SUBSONIC AND SUPERSONIC FLOW. Max. A. Heaslet and Harvard Lomax. March 1953. 25p. diags. (NACA TN 2900)

*Sweep - Complete Wings (Cont.)*

AN ANALYSIS OF THE FACTORS AFFECTING THE LOSS IN LIFT AND SHIFT IN AERODYNAMIC CENTER PRODUCED BY THE DISTORTION OF A SWEEP WING UNDER AERODYNAMIC LOAD. Charles W. Mathews and Max C. Kurbjun. March 1953. 65p. diagrs. (NACA TN 2901)

Taper and Twist  
(1.2.2.2.4)

INVESTIGATION OF THE CHARACTERISTICS OF A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Richard T. Whitcomb. August 28, 1946. 77p. diagrs., photos., 3 tabs. (NACA RM L6H28a) (Declassified from Restricted, 6/5/53)

MEASUREMENTS OF THE DAMPING IN ROLL OF LARGE-SCALE SWEEP-FORWARD AND SWEEP-BACK WINGS. Lynn W. Hunton and Joseph K. Dew. July 30, 1947. 39p. diagrs., photos., 2 tabs. (NACA RM A7D11) (Declassified from Restricted 6/5/53)

FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS. Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diagrs., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

INVESTIGATION OF NACA 64,2-432 AND 64,3-440 AIRFOIL SECTIONS WITH BOUNDARY-LAYER CONTROL AND AN ANALYTICAL STUDY OF THEIR POSSIBLE APPLICATIONS. Elmer A. Horton, Stanley F. Racisz and Nicholas J. Paradiso. July 1951. 40p. diagrs., photos., 2 tabs. (NACA TN 2405)

EFFECT OF TAPER RATIO ON THE LOW-SPEED ROLLING STABILITY DERIVATIVES OF SWEEP AND UNSWEEP WINGS OF ASPECT RATIO 2.61. Jack D. Brewer and Lewis R. Fisher. November 1951. 17p. diagrs., photo. (NACA TN 2555. Formerly RM L8H18)

CALCULATION OF LIFT AND PITCHING MOMENTS DUE TO ANGLE OF ATTACK AND STEADY PITCHING VELOCITY AT SUPERSONIC SPEEDS FOR THIN SWEEPBACK TAPERED WINGS WITH STREAMWISE TIPS AND SUPERSONIC LEADING AND TRAILING EDGES. John C. Martin, Kenneth Margolis and Isabella Jeffreys. June 1952. 116p. diagrs., 9 tabs. (NACA TN 2699)

SPAN LOAD DISTRIBUTIONS RESULTING FROM ANGLE OF ATTACK, ROLLING, AND PITCHING FOR TAPERED SWEEPBACK WINGS WITH STREAMWISE TIPS. SUPERSONIC LEADING AND TRAILING EDGES. John C. Martin and Isabella Jeffreys. July 1952. 143p. diagrs., 6 tabs. (NACA TN 2643)

A SIMPLE APPROXIMATE METHOD FOR CALCULATING SPANWISE LIFT DISTRIBUTIONS AND AERODYNAMIC INFLUENCE COEFFICIENTS AT SUBSONIC SPEEDS. Franklin W. Diederich. August 1952. 63p. diagrs., tab. (NACA TN 2751)

EFFECT OF LINEAR SPANWISE VARIATIONS OF TWIST AND CIRCULAR-ARC CAMBER ON LOW-SPEED STATIC STABILITY, ROLLING, AND YAWING CHARACTERISTICS OF A 45° SWEEPBACK WING OF ASPECT RATIO 4 AND TAPER RATIO 0.6. Byron M. Jaquet. August 1952. 27p. diagrs., 2 tabs. (NACA TN 2775)

SPAN LOAD DISTRIBUTIONS RESULTING FROM CONSTANT ANGLE OF ATTACK, STEADY ROLLING VELOCITY, STEADY PITCHING VELOCITY, AND CONSTANT VERTICAL ACCELERATION FOR TAPERED SWEEPBACK WINGS WITH STREAMWISE TIPS. SUBSONIC LEADING EDGES AND SUPERSONIC TRAILING EDGES. Margery E. Hannah and Kenneth Margolis. December 1952. 221p. diagrs., 4 tabs. (NACA TN 2831)

THEORETICAL CALCULATION OF THE PRESSURE DISTRIBUTION, SPAN LOADING, AND ROLLING MOMENT DUE TO SIDESLIP AT SUPERSONIC SPEEDS FOR THIN SWEEPBACK TAPERED WINGS WITH SUPERSONIC TRAILING EDGES AND WING TIPS PARALLEL TO THE AXIS OF WING SYMMETRY. Kenneth Margolis, Windsor L. Sherman and Margery E. Hannah. February 1953. 70p. diagrs., tab. (NACA TN 2898)

AN ANALYSIS OF THE FACTORS AFFECTING THE LOSS IN LIFT AND SHIFT IN AERODYNAMIC CENTER PRODUCED BY THE DISTORTION OF A SWEEP WING UNDER AERODYNAMIC LOAD. Charles W. Mathews and Max C. Kurbjun. March 1953. 65p. diagrs. (NACA TN 2901)

DETERMINATION OF MEAN CAMBER SURFACES FOR WINGS HAVING UNIFORM CHORDWISE LOADING AND ARBITRARY SPANWISE LOADING IN SUBSONIC FLOW. S. Katzoff, M. Frances Faison and Hugh C. DuBose. May 1953. 43p. diagrs., tab. (NACA TN 2908)

Inlets and Exits  
(1.2.2.2.5)

WIND-TUNNEL INVESTIGATION OF WING INLETS FOR A FOUR-ENGINE AIRPLANE. Walter A. Bartlett, Jr. and Edwin B. Goral. March 11, 1947. 65p. diagrs., photos., 7 tabs. (NACA RM L6L11) (Declassified from Restricted, 9/16/52)

A DESIGN STUDY OF LEADING-EDGE INLETS FOR UNSWEEP WINGS. Robert E. Dannenberg. June 30, 1950. 56p. diagrs., photos., 3 tabs. (NACA RM A9K02b) (Declassified from Restricted, 6/11/53)

Surface Conditions  
(1.2.2.2.6)

WIND-TUNNEL INVESTIGATION OF HIGH-LIFT AND STALL-CONTROL DEVICES ON A 37° SWEEPBACK WING OF ASPECT RATIO 6 AT HIGH REYNOLDS NUMBERS. William Koven and Robert R. Graham. September 2, 1948. 70p. diagrs., photos., tab. (NACA RM L8D29) (Declassified from Restricted, 6/29/53)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

## AERODYNAMICS

### 42 WINGS (1.2)

#### Surface Conditions - Complete Wings (Cont.)

EFFECTS OF MACH NUMBER VARIATION BETWEEN 0.07 AND 0.34 AND REYNOLDS NUMBER VARIATION BETWEEN  $0.97 \times 10^6$  AND  $8.10 \times 10^6$  ON THE MAXIMUM LIFT COEFFICIENT OF A WING OF NACA 64-210 AIRFOIL SECTIONS. James E. Fitzpatrick and William C. Schneider. August 1952. 34p. diagrs., photos., tab. (NACA TN 2753)

EFFECT OF LINEAR SPANWISE VARIATIONS OF TWIST AND CIRCULAR-ARC CAMBER ON LOW-SPEED STATIC STABILITY, ROLLING, AND YAWING CHARACTERISTICS OF A 45° SWEEPBACK WING OF ASPECT RATIO 4 AND TAPER RATIO 0.6. Byron M. Jaquet. August 1952. 27p. diagrs., 2 tabs. (NACA TN 2775)

#### Dihedral (1.2.2.2.7)

AN INVESTIGATION OF THE LOW-SPEED STABILITY AND CONTROL CHARACTERISTICS OF SWEEP-FORWARD AND SWEEP-BACK WINGS IN THE AMES 40- BY 80-FOOT WIND TUNNEL. Gerald M. McCormack and Victor I. Stevens, Jr. June 10, 1947. 172p. diagrs., photos., 2 tabs. (NACA RM A6K15) (Reclassified from Restricted, 7/3/51)

STABILITY AND CONTROL CHARACTERISTICS OF A COMPLETE AIRPLANE MODEL HAVING A WING WITH QUARTER-CHORD LINE SWEEP BACK 40°, ASPECT RATIO 2.50, AND TAPER RATIO 0.42. Marvin Schulderfrei, Paul Comisarow and Kenneth W. Goodson. December 1951. 86p. photos., diagrs. (NACA TN 2482. Formerly RM L7B25)

#### HIGH-LIFT DEVICES (1.2.2.3)

THE EFFECT OF BOUNDARY-LAYER CONTROL BY SUCTION AND SEVERAL HIGH-LIFT DEVICES ON THE LONGITUDINAL AERODYNAMIC CHARACTERISTICS OF A 47.5° SWEEPBACK WING-FUSELAGE COMBINATION. Jerome Pasamanick and Anthony J. Proterra. November 4, 1948. 44p. diagrs., photo., 2 tabs. (NACA RM L8E18) (Declassified from Restricted, 6/29/53)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

FULL-SCALE INVESTIGATION OF BOUNDARY-LAYER CONTROL BY SUCTION THROUGH LEADING-EDGE SLOTS ON A WING-FUSELAGE CONFIGURATION HAVING 47.5° LEADING-EDGE SWEEP WITH AND WITHOUT FLAPS. Jerome Pasamanick and Thomas B. Sellers. April 5, 1950. 55p. diagrs., photo., 2 tabs. (NACA RM L50B15) (Declassified from Restricted, 6/29/53)

WIND-TUNNEL INVESTIGATION AND ANALYSIS OF THE EFFECTS OF END PLATES ON THE AERODYNAMIC CHARACTERISTICS OF AN UNSWEPT WING. Donald R. Riley. August 1951. 55p. diagrs., photo., 2 tabs. (NACA TN 2440)

WIND-TUNNEL TESTS AT LOW SPEED OF SWEEP AND YAWED WINGS HAVING VARIOUS PLAN FORMS. Paul E. Purser and M. Leroy Spearman. December 1951. 82p. diagrs., photos., 2 tabs. (NACA TN 2445. Formerly RM L7D23)

LANGLEY FULL-SCALE-TUNNEL INVESTIGATION OF THE MAXIMUM-LIFT AND STALLING CHARACTERISTICS OF A TRAPEZOIDAL WING OF ASPECT RATIO 4 WITH CIRCULAR-ARC AIRFOIL SECTIONS. Roy H. Lange. November 1952. 24p. diagrs., photos. (NACA TN 2823. Formerly RM L7H19)

LANGLEY FULL-SCALE-TUNNEL TESTS OF THE CUSTER CHANNEL WING AIRPLANE. Jerome Pasamanick. April 1953. 57p. diagrs., photos., tab. (NACA RM L53A09)

METHOD FOR CALCULATING THE ROLLING AND YAWING MOMENTS DUE TO ROLLING FOR UNSWEPT WINGS WITH OR WITHOUT FLAPS OR ALERONS BY USE OF NONLINEAR SECTION LIFT DATA. Albert P. Martina. May 1953. 41p. diagrs., 11 tabs. (NACA TN 2937)

#### Trailing-Edge Flaps (1.2.2.3.1)

MEASUREMENTS OF THE DAMPING IN ROLL OF LARGE-SCALE SWEEP-FORWARD AND SWEEP-BACK WINGS. Lynn W. Hunton and Joseph K. Dew. July 30, 1947. 39p. diagrs., photos., 2 tabs. (NACA RM A7D11) (Declassified from Restricted, 6/5/53)

INVESTIGATION OF HIGH-LIFT AND STALL-CONTROL DEVICES ON AN NACA 64-SERIES 42° SWEEPBACK WING WITH AND WITHOUT FUSELAGE. Robert R. Graham and D. William Conner. October 14, 1947. 47p. diagrs., photos., 2 tabs. (NACA RM L7G09) (Declassified from Restricted, 6/25/53)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. I - CHARACTERISTICS OF A WING HAVING A DOUBLE-WEDGE AIRFOIL SECTION WITH MAXIMUM THICKNESS AT 20-PERCENT CHORD. Adrien E. Anderson. November 13, 1947. 59p. diagrs., photos., tab. (NACA RM A7F06) (Declassified from Restricted, 6/5/53)

WING-FLOW TESTS OF A TRIANGULAR WING OF ASPECT RATIO TWO. I. EFFECTIVENESS OF SEVERAL TYPES OF TRAILING-EDGE FLAPS ON FLAT-PLATE MODELS. George A. Rathert, Jr. and George E. Cooper. November 14, 1947. 61p. diagrs., photos. (NACA RM A7G18) (Declassified from Confidential, 6/5/53)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. II - THE EFFECT OF AIRFOIL SECTION MODIFICATIONS AND THE DETERMINATION OF THE WAKE DOWNWASH. Adrien E. Anderson. December 10, 1947. 78p. diagrs., photos., tab. (NACA RM A7H28) (Declassified from Restricted, 6/5/53)

LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. II - FLAPS. Leonard M. Rose. August 9, 1948. 17p. diagrs., photo. (NACA RM A7L11) (Declassified from Restricted, 6/11/53)

*Trailing-Edge Flaps - Complete Wings*  
(Cont.)

LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. I - THE EFFECT OF COMBINATION WITH A BODY OF REVOLUTION AND HEIGHT ABOVE A GROUND PLANE. Leonard M. Rose. August 27, 1948. 41p. diagrs., photos., 7 tabs. (NACA RM A7K03) (Declassified from Restricted, 6/11/53)

WIND-TUNNEL INVESTIGATION OF HIGH-LIFT AND STALL-CONTROL DEVICES ON A 37° SWEEPBACK WING OF ASPECT RATIO 6 AT HIGH REYNOLDS NUMBERS. William Koven and Robert R. Graham. September 2, 1948. 70p. diagrs., photos., tab. (NACA RM L8D29) (Declassified from Restricted, 6/29/53)

TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - THE EFFECTIVENESS AND HINGE MOMENTS OF A CONSTANT-CHORD PLAIN FLAP. Jack D. Stephenson and Arthur R. Amuendo. September 21, 1948. 82p. diagrs., photos., 9 tabs. (NACA RM A8E03) (Declassified from Restricted, 6/11/53)

INVESTIGATION AT LARGE SCALE OF THE PRESSURE DISTRIBUTION AND FLOW PHENOMENA OVER A WING WITH THE LEADING EDGE SWEEP BACK 47.5° HAVING CIRCULAR-ARC AIRFOIL SECTIONS AND EQUIPPED WITH DROOPED-NOSE AND PLAIN FLAPS. Roy H. Lange, Edward F. Whittle, Jr. and Marvin P. Fink. September 8, 1949. 72p. diagrs., 3 tabs. (NACA RM L9G15) (Declassified from Restricted, 6/29/53)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. III. CHARACTERISTICS OF WING WITH BODY AND VERTICAL TAIL. Adrien E. Anderson. October 14, 1949. 96p. diagrs., photos., 3 tabs. (NACA RM A9H04) (Declassified from Restricted, 6/11/53)

EFFECTS OF BOUNDARY-LAYER CONTROL ON THE LONGITUDINAL CHARACTERISTICS OF A 45° SWEEP-FORWARD WING-FUSELAGE COMBINATION. Gerald M. McCormack and Woodrow L. Cook. February 2, 1950. 73p. diagrs., photo., 2 tabs. (NACA RM A9K02a) (Declassified from Restricted, 6/29/53)

A STUDY OF THE USE OF EXPERIMENTAL STABILITY DERIVATIVES IN THE CALCULATION OF THE LATERAL DISTURBED MOTIONS OF A SWEEP-WING AIRPLANE AND COMPARISON WITH FLIGHT RESULTS. John D. Bird and Byron M. Jaquet. 1951. ii, 25p. diagrs., photos., 4 tabs. (NACA Rept. 1031. Formerly TN 2013)

INVESTIGATION OF SPOILER AILERONS FOR USE AS SPEED BRAKES OR GLIDE-PATH CONTROLS ON TWO NACA 65-SERIES WINGS EQUIPPED WITH FULL-SPAN SLOTTED FLAPS. Jack Fischel and James M. Watson. 1951. ii, 25p. diagrs. (NACA Rept. 1034. Formerly TN 1933)

EQUATIONS AND CHARTS FOR THE RAPID ESTIMATION OF HINGE-MOMENT AND EFFECTIVENESS PARAMETERS FOR TRAILING-EDGE CONTROLS HAVING LEADING AND TRAILING EDGES SWEEPED AHEAD OF THE MACH LINES. Kenneth L. Goin. 1951. ii, 71p. diagrs., 9 tabs. (NACA Rept. 1041. Formerly TN 2221)

AN ANALYTICAL INVESTIGATION OF EFFECT OF HIGH-LIFT FLAPS ON TAKE-OFF OF LIGHT AIRPLANES. Fred E. Weick, L. E. Flanagan, Jr., and H. H. Cherry, Agricultural and Mechanical College of Texas. September 1951. 101p. diagrs., 3 tabs. (NACA TN 2404)

INVESTIGATION AT LOW SPEED OF 45° AND 60° SWEEPBACK, TAPERED, LOW-DRAW WINGS EQUIPPED WITH VARIOUS TYPES OF FULL-SPAN, TRAILING-EDGE FLAPS. John J. Harper, Georgia Institute of Technology. October 1951. 53p. diagrs., photos., 3 tabs. (NACA TN 2468)

EFFECT OF GROUND INTERFERENCE ON THE AERODYNAMIC CHARACTERISTICS OF A 42° SWEEPBACK WING. G. Chester Furlong and Thomas V. Bollech. October 1951. 24p. diagrs., photos. (NACA TN 2487. Formerly RM L8F04)

STABILITY AND CONTROL CHARACTERISTICS OF A COMPLETE AIRPLANE MODEL HAVING A WING WITH QUARTER-CHORD LINE SWEEP BACK 40°, ASPECT RATIO 2.50, AND TAPER RATIO 0.42. Marvin Schuderfrei, Paul Comisarow and Kenneth W. Goodson. December 1951. 86p. photos., diagrs. (NACA TN 2482. Formerly RM L7B25)

INVESTIGATIONS OF THE BOUNDARY-LAYER CONTROL OF A FULL SCALE SWEEP WING WITH AIR BLED OFF FROM THE TURBOJET. (Recherches sur l'Hypersustentation d'une Aile en Fleche Reelle par Controle de la Couche Limite Utilisant le Prelevement d'Air sur le Turbo-Reacteur). P. Rebuffet and Ph Poisson-Quinton. April 1952. 43p. diagrs., photos. (NACA TM 1331. Trans. from Recherche Aéronautique, no.14, March-April, 1950, p.39-54)

EFFECT OF HIGH-LIFT DEVICES ON THE LOW-SPEED STATIC LATERAL AND YAWING STABILITY CHARACTERISTICS OF AN UNTAPERED 45° SWEEPBACK WING. Jacob H. Lichtenstein. May 1952. 20p. diagrs., photo. (NACA TN 2689. Formerly RM L8G20)

EFFECTS OF MACH NUMBER VARIATION BETWEEN 0.07 AND 0.34 AND REYNOLDS NUMBER VARIATION BETWEEN  $0.97 \times 10^6$  AND  $8.10 \times 10^6$  ON THE MAXIMUM LIFT COEFFICIENT OF A WING OF NACA 64-210 AIRFOIL SECTIONS. James E. Fitzpatrick and William C. Schneider. August 1952. 34p. diagrs., photos., tab. (NACA TN 2753)

EFFECT OF HIGH-LIFT DEVICES ON THE STATIC-LATERAL-STABILITY DERIVATIVES OF A 45° SWEEPBACK WING OF ASPECT RATIO 4.0 AND TAPER RATIO 0.6 IN COMBINATION WITH A BODY. Jacob H. Lichtenstein and James L. Williams. November 1952. 50p. diagrs., photos., 5 tabs. (NACA TN 2819)

Slots and Slats  
(1.2.2.3.2)

INVESTIGATION OF HIGH-LIFT AND STALL-CONTROL DEVICES ON AN NACA 64-SERIES 42° SWEEPBACK WING WITH AND WITHOUT FUSELAGE. Robert R. Graham and D. William Conner. October 14, 1947. 47p. diagrs., photos., 2 tabs. (NACA RM L7G09) (Declassified from Restricted, 6/25/53)

WIND-TUNNEL INVESTIGATION OF HIGH-LIFT AND STALL-CONTROL DEVICES ON A 37° SWEEPBACK WING OF ASPECT RATIO 6 AT HIGH REYNOLDS NUMBERS. William Koven and Robert R. Graham. September 2, 1948. 70p. diagrs., photos., tab. (NACA RM L8D29) (Declassified from Restricted, 6/29/53)

THE EFFECT OF BOUNDARY-LAYER CONTROL BY SUCTION AND OF SEVERAL HIGH-LIFT DEVICES ON THE AERODYNAMIC CHARACTERISTICS IN YAW OF A 47.5° SWEEPBACK WING-FUSELAGE COMBINATION. Jerome Pasamanick. October 28, 1948. 36p. diagrs., photo. (NACA RM L8E21) (Declassified from Restricted, 6/29/53)

A STUDY OF THE USE OF EXPERIMENTAL STABILITY DERIVATIVES IN THE CALCULATION OF THE LATERAL DISTURBED MOTIONS OF A SWEEP-WING AIRPLANE AND COMPARISON WITH FLIGHT RESULTS. John D. Bird and Byron M. Jaquet. 1951. ii, 25p. diagrs., photos., 4 tabs. (NACA Rept. 1031. Formerly TN 2013)

EXPERIMENTAL INVESTIGATION OF THE EFFECT OF VERTICAL-TAIL SIZE AND LENGTH AND OF FUSELAGE SHAPE AND LENGTH ON THE STATIC LATERAL STABILITY CHARACTERISTICS OF A MODEL WITH 45° SWEEPBACK WING AND TAIL SURFACES. M. J. Queijo and Walter D. Wolhart. 1951. ii, 29p. diagrs., photos., 4 tabs. (NACA Rept. 1049. Formerly TN 2168)

EFFECT OF HIGH-LIFT DEVICES ON THE STATIC LATERAL-STABILITY DERIVATIVES OF A 45° SWEEPBACK WING OF ASPECT RATIO 4.0 AND TAPER RATIO 0.6 IN COMBINATION WITH A BODY. Jacob H. Lichtenstein and James L. Williams. November 1952. 50p. diagrs., photos., 5 tabs. (NACA TN 2819)

CONTROLS  
(1.2.2.4)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. I - CHARACTERISTICS OF A WING HAVING A DOUBLE-WEDGE AIRFOIL SECTION WITH MAXIMUM THICKNESS AT 20-PERCENT CHORD. Adrian E. Anderson. November 13, 1947. 59p. diagrs., photos., tab. (NACA RM A7F06) (Declassified from Restricted, 6 5 53)

EFFECTS OF SEVERAL LEADING-EDGE MODIFICATIONS ON THE STALLING CHARACTERISTICS OF A 45° SWEEP-FORWARD WING. Gerald M. McCormack and Woodrow L. Cook. June 14, 1949. 46p. diagrs., photo., tab. (NACA RM A9D29) (Reclassified from Restricted, 7/3/51)

EFFECTS OF BOUNDARY-LAYER CONTROL ON THE LONGITUDINAL CHARACTERISTICS OF A 45° SWEEP-FORWARD WING-FUSELAGE COMBINATION. Gerald M. McCormack and Woodrow L. Cook. February 2, 1950. 73p. diagrs., photo., 2 tabs. (NACA RM A9K02a) (Declassified from Restricted, 6/29/53)

EQUATIONS AND CHARTS FOR THE RAPID ESTIMATION OF HINGE-MOMENT AND EFFECTIVENESS PARAMETERS FOR TRAILING-EDGE CONTROLS HAVING LEADING AND TRAILING EDGES SWEEP AHEAD OF THE MACH LINES. Kenneth L. Goin. 1951. -ii, 71p. diagrs., 9 tabs. (NACA Rept. 1041. Formerly TN 2221)

THEORETICAL ANTISYMMETRIC SPAN LOADING FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS. John DeYoung. 1951. 36p. diagrs., 9 tabs. (NACA Rept. 1056. Formerly TN 2140)

THREE PAPERS FROM CONFERENCE ON "WING AND TAIL-SURFACE OSCILLATIONS" - MARCH 6-8, 1941, MUNICH. I. REMARKS CONCERNING AERODYNAMICALLY BALANCED CONTROL SURFACES. (Bemerkung zum aerodynamisch innenausgeglichenen Ruder). H. Söhngen. II. AERODYNAMICALLY EQUIVALENT SYSTEMS FOR VARIOUS FORMS OF CONTROL SURFACES WITHIN THE SCOPE OF THE TWO-DIMENSIONAL WING THEORY. (Aerodynamische Ersatzsysteme für verschiedene Ruderformen im Rahmen der zweidimensionalen Tragflächentheorie). L. Schwarz. III. COMPARATIVE CALCULATIONS CONCERNING AERODYNAMIC BALANCE OF CONTROL SURFACES. (Vergleichsrechnungen zum aerodynamischen Ruderinnenausgleich). F. Dietze. August 1951. 47p. diagrs., tab. (NACA TM 1306. Trans. from Lilienthal Gesellschaft für Luftfahrtforschung, Berlin. Bericht 135, p.61-74)

EFFECT OF GROUND INTERFERENCE ON THE AERODYNAMIC CHARACTERISTICS OF A 42° SWEEPBACK WING. G. Chester Furlong and Thomas V. Bollech. October 1951. 24p. diagrs., photos. (NACA TN 2487. Formerly RM L8F04)

THEORETICAL SYMMETRIC SPAN LOADING DUE TO FLAP DEFLECTION FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS. John DeYoung. 1952. ii, 41p. diagrs., tabs. (NACA Rept. 1071. Formerly NACA TN 2278)

INVESTIGATIONS OF THE BOUNDARY-LAYER CONTROL OF A FULL SCALE SWEEP WING WITH AIR BLED OFF FROM THE TURBOJET. (Recherches sur l'Hypersustentation d'une Aile en Fleche Reelle par Controle de la Couche Limite Utilisant le Prelevement d'Air sur le Turbo-Reacteur). P. Rebuffet and Ph Poisson-Quinton. April 1952. 43p. diagrs., photos. (NACA TM 1331. Trans. from Recherche Aéronautique, no.14, March-April, 1950, p.39-54)

EFFECT OF HIGH-LIFT DEVICES ON THE LOW-SPEED STATIC LATERAL AND YAWING STABILITY CHARACTERISTICS OF AN UNTAPERED 45° SWEEPBACK WING. Jacob H. Lichtenstein. May 1952. 20p. diagrs., photo. (NACA TN 2689. Formerly RM L8G20)

*Controls - Complete Wings (Cont.)*

METHOD FOR CALCULATING THE ROLLING AND YAWING MOMENTS DUE TO ROLLING FOR UNSWEPT WINGS WITH OR WITHOUT FLAPS OR AILERONS BY USE OF NONLINEAR SECTION LIFT DATA. Albert P. Martina. May 1953. 41p. diagrs., 11 tabs. (NACA TN 2937)

Flap Type  
(1.2.2.4.1)

AN INVESTIGATION OF A HIGH-ASPECT-RATIO WING HAVING 0.20-CHORD PLAIN AILERONS IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Arvo A. Luoma. August 28, 1946. 124p. diagrs., photos., 2 tabs. (NACA RM L6H28d) (Declassified from Restricted, 6/5/53)

AN INVESTIGATION OF THE HINGE-MOMENT FLUCTUATIONS OF 0.20-CHORD PLAIN AILERONS ON A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Arvo A. Luoma and Luke L. Liccini. January 10, 1947. 9p. diagrs. (NACA RM L6L10a) (Declassified from Restricted, 6/5/53)

INVESTIGATION AT HIGH SPEEDS OF A HORIZONTAL-TAIL MODEL IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Ralph P. Bielat. January 31, 1947. 102p. diagrs., 3 tabs. (NACA RM L6L10b) (Declassified from Restricted, 6/5/53)

PRELIMINARY INVESTIGATION AT LOW SPEEDS OF SWEPT WINGS IN ROLLING FLOW. David Feigenbaum and Alex Goodman. May 22, 1947. 29p. diagrs., photo. (NACA RM L7E09) (Reclassified from Restricted, 6/27/51)

AN INVESTIGATION OF THE LOW-SPEED STABILITY AND CONTROL CHARACTERISTICS OF SWEPT-FORWARD AND SWEPT-BACK WINGS IN THE AMES 40- BY 80-FOOT WIND TUNNEL. Gerald M. McCormack and Victor I. Stevens, Jr. June 10, 1947. 172p. diagrs., photos., 2 tabs. (NACA RM A6K15) (Reclassified from Restricted, 7/3/51)

LONGITUDINAL STABILITY AND CONTROL OF HIGH-SPEED AIRPLANES WITH PARTICULAR REFERENCE TO DIVE RECOVERY. John A. Axelson. September 4, 1947. 25p. diagrs. (NACA RM A7C24) (Reclassified from Restricted, 6/27/51)

INVESTIGATION OF HIGH-LIFT AND STALL-CONTROL DEVICES ON AN NACA 64-SERIES 42° SWEPTBACK WING WITH AND WITHOUT FUSELAGE. Robert R. Graham and D. William Conner. October 14, 1947. 47p. diagrs., photos., 2 tabs. (NACA RM L7G09) (Declassified from Restricted, 6/25/53)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. I - CHARACTERISTICS OF A WING HAVING A DOUBLE-WEDGE AIRFOIL SECTION WITH MAXIMUM THICKNESS AT 20-PERCENT CHORD. Adrien E. Anderson. November 13, 1947. 59p. diagrs., photos., tab. (NACA RM A7F06) (Declassified from Restricted, 6 5 53)

WING-FLOW TESTS OF A TRIANGULAR WING OF ASPECT RATIO TWO. I. EFFECTIVENESS OF SEVERAL TYPES OF TRAILING-EDGE FLAPS ON FLAT-PLATE MODELS. George A. Rathert, Jr. and George E. Cooper. November 14, 1947. 61p. diagrs., photos. (NACA RM A7G18) (Declassified from Confidential, 6/5/53)

FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS. Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diagrs., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. II - FLAPS. Leonard M. Rose. August 9, 1948. 17p. diagrs., photo. (NACA RM A7L11) (Declassified from Restricted, 6/11/53)

TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - THE EFFECTIVENESS AND HINGE MOMENTS OF A CONSTANT-CHORD PLAIN FLAP. Jack D. Stephenson and Arthur R. Amuendo. September 21, 1948. 82p. diagrs., photos., 9 tabs. (NACA RM A8E03) (Declassified from Restricted, 6/11/53)

THE EFFECT OF BOUNDARY-LAYER CONTROL BY SUCTION AND OF SEVERAL HIGH-LIFT DEVICES ON THE AERODYNAMIC CHARACTERISTICS IN YAW OF A 47.5° SWEPTBACK WING-FUSELAGE COMBINATION. Jerome Pasamanick. October 28, 1948. 36p. diagrs., photo. (NACA RM L8E21) (Declassified from Restricted, 6/29/53)

TESTS OF A MODEL HORIZONTAL TAIL OF ASPECT RATIO 4.5 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. I - QUARTER-CHORD LINE SWEPT BACK 35°. Bruce E. Tinling and Jerald K. Dickson. September 9, 1949. 118p. diagrs., photo., tab. (NACA RM A9G13) (Declassified from Restricted, 6/11/53)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. III. CHARACTERISTICS OF WING WITH BODY AND VERTICAL TAIL. Adrien E. Anderson. October 14, 1949. 96p. diagrs., photos., 3 tabs. (NACA RM A9H04) (Declassified from Restricted, 6/11/53)

TESTS OF A MODEL HORIZONTAL TAIL OF ASPECT RATIO 4.5 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - ELEVATOR HINGE LINE NORMAL TO THE PLANE OF SYMMETRY. Bruce E. Tinling and Jerald K. Dickson. October 17, 1949. 106p. diagrs., photo., tabs. (NACA RM A9H11a) (Declassified from Restricted, 6/11/53)

EQUATIONS AND CHARTS FOR THE RAPID ESTIMATION OF HINGE-MOMENT AND EFFECTIVENESS PARAMETERS FOR TRAILING-EDGE CONTROLS HAVING LEADING AND TRAILING EDGES SWEPT AHEAD OF THE MACH LINES. Kenneth L. Goin. 1951. ii, 71p. diagrs., 9 tabs. (NACA Rept. 1041. Formerly TN 2221)

**AERODYNAMICS**  
**46 WINGS (1.2)**

**Flap Type Controls - Complete Wings**  
**(Cont.)**

**AN ANALYTICAL INVESTIGATION OF EFFECT OF HIGH-LIFT FLAPS ON TAKE-OFF OF LIGHT AIRPLANES.** Fred E. Weick, L. E. Flanagan, Jr., and H. H. Cherry, Agricultural and Mechanical College of Texas. September 1951. 101p. diagrs., 3 tabs. (NACA TN 2404)

**WIND-TUNNEL INVESTIGATION OF EFFECTS OF VARIOUS AERODYNAMIC BALANCE SHAPES AND SWEEPBACK ON CONTROL-SURFACE CHARACTERISTICS OF SEMISPAN TAIL SURFACES WITH NACA 0009, 0015, 66-009, 66(215)-014, AND CIRCULAR-ARC AIRFOIL SECTIONS.** John J. Harper, Georgia Institute of Technology. October 1951. 127p. diagrs., photos., 5 tabs. (NACA TN 2495)

**EXPERIMENTAL INVESTIGATION OF ROLLING PERFORMANCE OF STRAIGHT AND SWEEPBACK FLEXIBLE WINGS WITH VARIOUS AILERONS.** Henry A. Cole, Jr. and Victor M. Ganzer, University of Washington. December 1951. 45p. diagrs., photos., 2 tabs. (NACA TN 2563)

**Spoilers**  
**(1.2.2.4.2)**

**THE EFFECTIVENESS OF A TRAILING-EDGE SPOILER ON A SWEEP-BACK AIRFOIL AT TRANSONIC SPEEDS FROM TESTS BY THE NACA WING-FLOW METHOD.** Norman S. Silsby and Fred L. Daum. January 20, 1947. 13p. diagrs., photo. (NACA RM L6K12a) (Reclassified from Confidential, 7/3/51)

**INVESTIGATION OF SPOILER AILERONS FOR USE AS SPEED BRAKES OR GLIDE-PATH CONTROLS ON TWO NACA 65-SERIES WINGS EQUIPPED WITH FULL-SPAN SLOTTED FLAPS.** Jack Fischel and James M. Watson. 1951. ii, 25p. diagrs. (NACA Rept. 1034. Formerly TN 1933)

**LATERAL CONTROL BY SPOILERS AT THE DVL.** (DVL - Unterbrecherquersteuerung). M. Kramer, Th. Zobel and C. G. Esche. I. SYSTEMATIC WIND-TUNNEL TESTS CONCERNING THE PROBLEM OF LATERAL CONTROL BY SPOILERS PERMEABLE TO AIR. M. Kramer and Th. Zobel. II. CONTRIBUTION TO THE LATERAL CONTROL BY SPOILERS AT THE DVL. M. Kramer. III. FLIGHT TESTS IN THE LATERAL CONTROLS BY SPOILERS ON THE AIRPLANE MODEL FIESELER FI 156. C. G. Esche. August 1951. 82p. diagrs., photo., tab. (NACA TM 1307. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 964).

**All-Movable**  
**(1.2.2.4.3)**

**WIND-TUNNEL INVESTIGATION OF EFFECTS OF VARIOUS AERODYNAMIC BALANCE SHAPES AND SWEEPBACK ON CONTROL-SURFACE CHARACTERISTICS OF SEMISPAN TAIL SURFACES WITH NACA 0009, 0015, 66-009, 66(215)-014, AND CIRCULAR-ARC AIRFOIL SECTIONS.** John J. Harper, Georgia Institute of Technology. October 1951. 127p. diagrs., photos., 5 tabs. (NACA TN 2495)

**REYNOLDS NUMBER EFFECTS**  
**(1.2.2.5)**

**INVESTIGATION OF THE CHARACTERISTICS OF A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL.** Richard T. Whitcomb. August 28, 1946. 77p. diagrs., photos., 3 tabs. (NACA RM L6H28a) (Declassified from Restricted, 6/5/53)

**SUMMARY OF AVAILABLE DATA RELATING TO REYNOLDS NUMBER EFFECTS ON THE MAXIMUM LIFT COEFFICIENTS OF SWEEP-BACK WINGS.** Harold H. Sweberg and Roy H. Lange. March 4, 1947. 20p. diagrs., tab. (NACA RM L6L20a) (Declassified from Restricted, 2/28/52)

**EFFECT OF MACH NUMBER ON THE MAXIMUM LIFT AND BUFFETING BOUNDARY DETERMINED IN FLIGHT ON A NORTH AMERICAN P-51D AIRPLANE.** John P. Mayer. June 12, 1947. 19p. diagrs., photo. (NACA RM L6I10) (Reclassified from Confidential, 7/3/51)

**AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. I - CHARACTERISTICS OF A WING HAVING A DOUBLE-WEDGE AIRFOIL SECTION WITH MAXIMUM THICKNESS AT 20-PERCENT CHORD.** Adrien E. Anderson. November 13, 1947. 59p. diagrs., photos., tab. (NACA RM A7F06) (Declassified from Restricted, 6/5/53)

**AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. II - THE EFFECT OF AIRFOIL SECTION MODIFICATIONS AND THE DETERMINATION OF THE WAKE DOWNWASH.** Adrien E. Anderson. December 10, 1947. 78p. diagrs., photos., tab. (NACA RM A7H28) (Declassified from Restricted, 6/5/53)

**TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. I - THE EFFECT OF REYNOLDS NUMBER AND MACH NUMBER ON THE AERODYNAMIC CHARACTERISTICS OF THE WING WITH FLAP UNDEFLECTED.** George G. Edwards and Jack D. Stephenson. January 22, 1948. 42p. diagrs., photos. (NACA RM A7K05) (Declassified from Restricted, 6/11/53)

**WIND-TUNNEL INVESTIGATION OF HIGH-LIFT AND STALL-CONTROL DEVICES ON A 37° SWEEP-BACK WING OF ASPECT RATIO 6 AT HIGH REYNOLDS NUMBERS.** William Koven and Robert R. Graham. September 2, 1948. 70p. diagrs., photos., tab. (NACA RM L8D29) (Declassified from Restricted, 6/29/53)

**TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - THE EFFECTIVENESS AND HINGE MOMENTS OF A CONSTANT-CHORD PLAIN FLAP.** Jack D. Stephenson and Arthur R. Amuendo. September 21, 1948. 82p. diagrs., photos., 9 tabs. (NACA RM A8E03) (Declassified from Restricted, 6/11/53)

*Reynolds Number Effects - Complete  
Wings (Cont.)*

THE EFFECT OF BOUNDARY-LAYER CONTROL BY SUCTION AND SEVERAL HIGH-LIFT DEVICES ON THE LONGITUDINAL AERODYNAMIC CHARACTERISTICS OF A 47.5° SWEEPBACK WING-FUSELAGE COMBINATION. Jerome Pasamanick and Anthony J. Proterra. November 4, 1948. 44p. diagrs., photo., 2 tabs. (NACA RM L8E18) (Declassified from Restricted, 6/29/53)

TESTS OF A MODEL HORIZONTAL TAIL OF ASPECT RATIO 4.5 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. I - QUARTER-CHORD LINE SWEEP BACK 35°. Bruce E. Tinling and Jerald K. Dickson. September 9, 1949. 118p. diagrs., photo., tab. (NACA RM A9G13) (Declassified from Restricted, 6/11/53)

TESTS OF A MODEL HORIZONTAL TAIL OF ASPECT RATIO 4.5 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - ELEVATOR HINGE LINE NORMAL TO THE PLANE OF SYMMETRY. Bruce E. Tinling and Jerald K. Dickson. October 17, 1949. 106p. diagrs., photo., tabs. (NACA RM A9H11a) (Declassified from Restricted, 6/11/53)

FULL-SCALE INVESTIGATION OF BOUNDARY-LAYER CONTROL BY SUCTION THROUGH LEADING-EDGE SLOTS ON A WING-FUSELAGE CONFIGURATION HAVING 47.5° LEADING-EDGE SWEEP WITH AND WITHOUT FLAPS. Jerome Pasamanick and Thomas B. Sellers. April 5, 1950. 55p. diagrs., photo., 2 tabs. (NACA RM L50B15) (Declassified from Restricted, 6/29/53)

INVESTIGATION OF SPOILER AILERONS FOR USE AS SPEED BRAKES OR GLIDE-PATH CONTROLS ON TWO NACA 65-SERIES WINGS EQUIPPED WITH FULL-SPAN SLOTTED FLAPS. Jack Fischel and James M. Watson. 1951. ii, 25p. diagrs. (NACA Rept. 1034. Formerly TN 1933)

EFFECT OF GROUND INTERFERENCE ON THE AERODYNAMIC CHARACTERISTICS OF A 42° SWEEPBACK WING. G. Chester Furlong and Thomas V. Bollech. October 1951. 24p. diagrs., photos. (NACA TN 2487. Formerly RM L8F04)

THE EFFECT OF RATE OF CHANGE OF ANGLE OF ATTACK ON THE MAXIMUM LIFT COEFFICIENT OF A PURSUIT AIRPLANE. Burnett L. Gadeberg. October 1951. 17p. diagrs., photo. (NACA TN 2525. Formerly RM A8130)

EXPERIMENTAL INVESTIGATION OF BASE PRESSURE ON BLUNT-TRAILING-EDGE WINGS AT SUPERSONIC VELOCITIES. Dean R. Chapman, William R. Wimbrow and Robert H. Kester. January 1952. 53p. diagrs., photos., tab. (NACA TN 2611)

EFFECTS OF MACH NUMBER VARIATION BETWEEN 0.07 AND 0.34 AND REYNOLDS NUMBER VARIATION BETWEEN  $0.97 \times 10^6$  AND  $8.10 \times 10^6$  ON THE MAXIMUM LIFT COEFFICIENT OF A WING OF NACA 64-210 AIRFOIL SECTIONS. James E. Fitzpatrick and William C. Schneider. August 1952. 34p. diagrs., photos., tab. (NACA TN 2753)

INVESTIGATION OF THE EFFECTS OF VARIATIONS IN THE REYNOLDS NUMBER BETWEEN  $0.4 \times 10^6$  AND  $3.0 \times 10^6$  ON THE LOW-SPEED AERODYNAMIC CHARACTERISTICS OF THREE LOW-ASPECT-RATIO SYMMETRICAL WINGS WITH RECTANGULAR PLAN FORMS. George W. Jones, Jr. September 1952. 13p. diagrs. (NACA RM L52G18)

LANGLEY FULL-SCALE-TUNNEL INVESTIGATION OF THE MAXIMUM-LIFT AND STALLING CHARACTERISTICS OF A TRAPEZOIDAL WING OF ASPECT RATIO 4 WITH CIRCULAR-ARC AIRFOIL SECTIONS. Roy H. Lange. November 1952. 24p. diagrs., photos. (NACA TN 2823. Formerly RM L7H19)

MACH NUMBER EFFECTS  
(1.2.2.6)

PRELIMINARY TESTS AT TRANSONIC SPEEDS OF A MODEL OF A CONSTANT-CHORD WING WITH A SWEEPBACK OF 45° AND AN NACA 65<sub>(112)</sub>-210,  $a = 1.0$  AIRFOIL SECTION. John A. Zalovick and Richard E. Adams. December 1945. 21p. diagrs., photos. (NACA ACR L5J16a) (Reclassified from Confidential, 7/3/51)

INVESTIGATION OF THE CHARACTERISTICS OF A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Richard T. Whitcomb. August 28, 1946. 77p. diagrs., photos., 3 tabs. (NACA RM L6H28a) (Declassified from Restricted, 6/5/53)

PRELIMINARY INVESTIGATION OF DOWNWASH FLUCTUATIONS OF A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Antonio Ferri. August 28, 1946. 25p. diagrs. (NACA RM L6H28b) (Declassified from Restricted, 6/5/53)

AN INVESTIGATION OF A HIGH-ASPECT-RATIO WING HAVING 0.20-CHORD PLAIN AILERONS IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Arvo A. Luoma. August 28, 1946. 124p. diagrs., photos., 2 tabs. (NACA RM L6H28d) (Declassified from Restricted, 6/5/53)

AN INVESTIGATION OF THE HINGE-MOMENT FLUCTUATIONS OF 0.20-CHORD PLAIN AILERONS ON A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Arvo A. Luoma and Luke L. Liccini. January 10, 1947. 9p. diagrs. (NACA RM L6L10a) (Declassified from Restricted, 6/5/53)

THE EFFECTIVENESS OF A TRAILING-EDGE SPOILER ON A SWEEP-BACK AIRFOIL AT TRANSONIC SPEEDS FROM TESTS BY THE NACA WING-FLOW METHOD. Norman S. Silsby and Fred L. Daum. January 20, 1947. 13p. diagrs., photo. (NACA RM L6K12a) (Reclassified from Confidential, 7/3/51)

INVESTIGATION AT HIGH SPEEDS OF A HORIZONTAL-TAIL MODEL IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Ralph P. Bielat. January 31, 1947. 102p. diagrs., 3 tabs. (NACA RM L6L10b) (Declassified from Restricted, 6/5/53)



**AERODYNAMICS**  
**48 WINGS (1.2)**

**Mach Number Effects - Complete**  
**Wings (Cont.)**

COMPARATIVE DRAG MEASUREMENTS AT TRANSONIC SPEEDS OF AN NACA 65-006 AIRFOIL AND A SYMMETRICAL CIRCULAR-ARC AIRFOIL. Jim Rogers Thompson and Bernard W. Marschner. March 6, 1947. 16p. diagrs., photo. (NACA RM L6J30) (Declassified from Confidential, 7/20/51)

EFFECT OF MACH NUMBER ON THE MAXIMUM LIFT AND BUFFETING BOUNDARY DETERMINED IN FLIGHT ON A NORTH AMERICAN P-51D AIRPLANE. John P. Mayer. June 12, 1947. 19p. diagrs., photo. (NACA RM L6I10) (Reclassified from Confidential, 7/3/51)

MEASUREMENTS OF THE DAMPING IN ROLL OF LARGE-SCALE SWEEP-FORWARD AND SWEEP-BACK WINGS. Lynn W. Hunton and Joseph K. Dew. July 30, 1947. 39p. diagrs., photos., 2 tabs. (NACA RM A7D11) (Declassified from Restricted 6/5/53)

LONGITUDINAL STABILITY AND CONTROL OF HIGH-SPEED AIRPLANES WITH PARTICULAR REFERENCE TO DIVE RECOVERY. John A. Axelson. September 4, 1947. 25p. diagrs. (NACA RM A7C24) (Reclassified from Restricted, 6/27/51)

WING-FLOW TESTS OF A TRIANGULAR WING OF ASPECT RATIO TWO. I. EFFECTIVENESS OF SEVERAL TYPES OF TRAILING-EDGE FLAPS ON FLAT-PLATE MODELS. George A. Rathert, Jr. and George E. Cooper. November 14, 1947. 61p. diagrs., photos. (NACA RM A7G18) (Declassified from Confidential, 6/5/53)

TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. I - THE EFFECT OF REYNOLDS NUMBER AND MACH NUMBER ON THE AERODYNAMIC CHARACTERISTICS OF THE WING WITH FLAP UNDEFLECTED. George G. Edwards and Jack D. Stephenson. January 22, 1948. 42p. diagrs., photos. (NACA RM A7K05) (Declassified from Restricted, 6/11/53)

CORRELATION OF WIND-TUNNEL AND FLIGHT DETERMINATIONS OF THE BUFFET SPEED OF AN AIRPLANE EQUIPPED WITH EXTERNAL STORES. H. Norman Silvers and Kenneth P. Spreemann. March 2, 1948. 54p. diagrs., photos., tab. (NACA RM L7E20) (Declassified from Restricted, 9/16/52)

TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - THE EFFECTIVENESS AND HINGE MOMENTS OF A CONSTANT-CHORD PLAIN FLAP. Jack D. Stephenson and Arthur R. Amuendo. September 21, 1948. 82p. diagrs., photos., 9 tabs. (NACA RM A8E03) (Declassified from Restricted, 6/11/53)

TESTS OF A MODEL HORIZONTAL TAIL OF ASPECT RATIO 4.5 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. I - QUARTER-CHORD LINE SWEEP BACK 35°. Bruce E. Tinling and Jerald K. Dickson. September 9, 1949. 118p. diagrs., photo., tab. (NACA RM A9G13) (Declassified from Restricted, 6/11/53)

TESTS OF A MODEL HORIZONTAL TAIL OF ASPECT RATIO 4.5 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - ELEVATOR HINGE LINE NORMAL TO THE PLANE OF SYMMETRY. Bruce E. Tinling and Jerald K. Dickson. October 17, 1949. 106p. diagrs., photo., tabs. (NACA RM A9H11a) (Declassified from Restricted, 6/11/53)

STUDY OF EFFECTS OF SWEEP ON THE FLUTTER OF CANTILEVER WINGS. J. G. Barmby, H. J. Cunningham and I. E. Garrick. 1951. ii, 25p. diagrs., photo., 7 tabs. (NACA Rept. 1014. Formerly TN 2121; RM L8H30)

INVESTIGATION OF SPOILERAILERONS FOR USE AS SPEED BRAKES OR GLIDE-PATH CONTROLS ON TWO NACA 65-SERIES WINGS EQUIPPED WITH FULL-SPAN SLOTTED FLAPS. Jack Fischel and James M. Watson. 1951. ii, 25p. diagrs. (NACA Rept. 1034. Formerly TN 1933)

FORMULAS FOR THE SUPERSONIC LOADING, LIFT AND DRAG OF FLAT SWEEP-BACK WINGS WITH LEADING EDGES BEHIND THE MACH LINES. Doris Cohen. 1951. iii, 40p. diagrs. (NACA Rept. 1050)

A SUMMARY OF LATERAL-STABILITY DERIVATIVES CALCULATED FOR WING PLAN FORMS IN SUPERSONIC FLOW. Arthur L. Jones and Alberta Alksne. 1951. ii, 35p. diagrs., 3 tabs. (NACA Rept. 1052)

THREE-DIMENSIONAL UNSTEADY LIFT PROBLEMS IN HIGH-SPEED FLIGHT - THE TRIANGULAR WING. Harvard Lomax, Max A. Heaslet and Franklyn B. Fuller. June 1951. 62p. diagrs. (NACA TN 2387)

AIR FORCES AND MOMENTS ON TRIANGULAR AND RELATED WINGS WITH SUBSONIC LEADING EDGES OSCILLATING IN SUPERSONIC POTENTIAL FLOW. Charles E. Watkins. September 1951. 44p. diagrs. (NACA TN 2457)

LIFT AND MOMENT ON OSCILLATING TRIANGULAR AND RELATED WINGS WITH SUPERSONIC EDGES. Herbert C. Nelson. September 1951. 34p. diagrs. (NACA TN 2494)

THE EFFECT OF RATE OF CHANGE OF ANGLE OF ATTACK ON THE MAXIMUM LIFT COEFFICIENT OF A PURSUIT AIRPLANE. Burnett L. Gadeberg. October 1951. 17p. diagrs., photo. (NACA TN 2525. Formerly RM A8I30)

INVESTIGATIONS ON WINGS WITH AND WITHOUT SWEEPBACK AT HIGH SUBSONIC SPEEDS. (Untersuchungen an gefeiltten und ungefeiltten Flügeln bei hohen Unterschallgeschwindigkeiten). Jakob Ackeret, Max Degen and Nikolaus Rott. November 1951. 14p. diagrs., photos. (NACA TM 1320. Trans. from Zeitschrift für angewandte Mathematik und Physik, v.1, 1950, p.32-42).

EFFECTS OF COMPRESSIBILITY ON THE PERFORMANCE OF TWO FULL-SCALE HELICOPTER ROTORS. Paul J. Carpenter. 1952. ii, 8p. diagrs., photo. (NACA Rept. 1078. Formerly TN 2277)

*Mach Number Effects - Complete  
Wings (Cont.)*

EXPERIMENTAL INVESTIGATION OF BASE PRESSURE ON BLUNT-TRAILING-EDGE WINGS AT SUPERSONIC VELOCITIES. Dean R. Chapman, William R. Wimbrow and Robert H. Kester. January 1952. 53p. diags., photos., tab. (NACA TN 2611)

CALCULATION OF LIFT AND PITCHING MOMENTS DUE TO ANGLE OF ATTACK AND STEADY PITCHING VELOCITY AT SUPERSONIC SPEEDS FOR THIN SWEPTBACK TAPERED WINGS WITH STREAMWISE TIPS AND SUPERSONIC LEADING AND TRAILING EDGES. John C. Martin, Kenneth Margolis and Isabella Jeffreys. June 1952. 116p. diags., 9 tabs. (NACA TN 2699)

TRANSONIC SIMILARITY RULES FOR LIFTING WINGS. Keith C. Harder. June 1952. 26p. diagr. (NACA TN 2724)

ON THE APPLICATION OF TRANSONIC SIMILARITY RULES. John R. Spreiter. June 1952. 45p. diags. (NACA TN 2726)

SPAN LOAD DISTRIBUTIONS RESULTING FROM ANGLE OF ATTACK, ROLLING, AND PITCHING FOR TAPERED SWEPTBACK WINGS WITH STREAMWISE TIPS. SUPERSONIC LEADING AND TRAILING EDGES. John C. Martin and Isabella Jeffreys. July 1952. 143p. diags., 6 tabs. (NACA TN 2643)

EFFECTS OF MACH NUMBER VARIATION BETWEEN 0.07 AND 0.34 AND REYNOLDS NUMBER VARIATION BETWEEN  $0.97 \times 10^6$  AND  $8.10 \times 10^6$  ON THE MAXIMUM LIFT COEFFICIENT OF A WING OF NACA 64-210 AIRFOIL SECTIONS. James E. Fitzpatrick and William C. Schneider. August 1952. 34p. diags., photos., tab. (NACA TN 2753)

EFFECT OF A FINITE TRAILING-EDGE THICKNESS ON THE DRAG OF RECTANGULAR AND DELTA WINGS AT SUPERSONIC SPEEDS. E. B. Klunker and Conrad Rennemann, Jr. November 1952. 26p. diags. (NACA TN 2828)

SPAN LOAD DISTRIBUTIONS RESULTING FROM CONSTANT ANGLE OF ATTACK, STEADY ROLLING VELOCITY, STEADY PITCHING VELOCITY, AND CONSTANT VERTICAL ACCELERATION FOR TAPERED SWEPTBACK WINGS WITH STREAMWISE TIPS. SUBSONIC LEADING EDGES AND SUPERSONIC TRAILING EDGES. Margery E. Hannah and Kenneth Margolis. December 1952. 221p. diags., 4 tabs. (NACA TN 2831)

THEORETICAL CALCULATION OF THE PRESSURE DISTRIBUTION, SPAN LOADING, AND ROLLING MOMENT DUE TO SIDESLIP AT SUPERSONIC SPEEDS FOR THIN SWEPTBACK TAPERED WINGS WITH SUPERSONIC TRAILING EDGES AND WING TIPS PARALLEL TO THE AXIS OF WING SYMMETRY. Kenneth Margolis, Windsor L. Sherman and Margery E. Hannah. February 1953. 70p. diags., tab. (NACA TN 2898)

WAKE  
(1.2.2.7)

INVESTIGATION OF THE CHARACTERISTICS OF A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Richard T. Whitcomb. August 28, 1946. 77p. diags., photos., 3 tabs. (NACA RM L6H28a) (Declassified from Restricted, 6/5/53)

PRELIMINARY INVESTIGATION OF DOWNWASH FLUCTUATIONS OF A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Antonio Ferri. August 28, 1946. 25p. diags. (NACA RM L6H28b) (Declassified from Restricted, 6/5/53)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. II - THE EFFECT OF AIRFOIL SECTION MODIFICATIONS AND THE DETERMINATION OF THE WAKE DOWNWASH. Adrien E. Anderson. December 10, 1947. 78p. diags., photos., tab. (NACA RM A7H28) (Declassified from Restricted, 6/5/53)

AN INVESTIGATION OF THE DOWNWASH AND WAKE BEHIND LARGE-SCALE SWEPT AND UNSWEPT WINGS. William H. Tolhurst, Jr. February 2, 1948. 25p. diags., photo. (NACA RM A7L05) (Declassified from Restricted, 6/11/53)

WIND-TUNNEL INVESTIGATION OF HIGH-LIFT AND STALL-CONTROL DEVICES ON A  $37^\circ$  SWEPTBACK WING OF ASPECT RATIO 6 AT HIGH REYNOLDS NUMBERS. William Koven and Robert R. Graham. September 2, 1948. 70p. diags., photos., tab. (NACA RM L8D29) (Declassified from Restricted, 6/29/53)

STUDY OF VORTEX SHEDDING AS RELATED TO SELF-EXCITED TORSIONAL OSCILLATIONS OF AN AIRFOIL. Raymond L. Chuan and Richard J. Magnus, California Institute of Technology. September 1951. 49p. diags. (NACA TN 2429)

THEORETICAL SYMMETRIC SPAN LOADING DUE TO FLAP DEFLECTION FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS. John DeYoung. 1952. ii, 41p. diags., tabs. (NACA Rept. 1071. Formerly NACA TN 2278)

ANALYSIS OF THE EFFECTS OF WING INTERFERENCE ON THE TAIL CONTRIBUTIONS TO THE ROLLING DERIVATIVES. William H. Michael, Jr. 1952. ii, 12p. diags. (NACA Rept. 1086. Formerly TN 2332)

BEHAVIOR OF VORTEX SYSTEM BEHIND CRUCIFORM WINGS - MOTIONS OF FULLY ROLLED-UP VORTICES. Alvin H. Sacks. January 1952. 40p. photos., diags. (NACA TN 2605)

SOME EXPERIMENTS ON VISUALIZATION OF FLOW FIELDS BEHIND LOW-ASPECT-RATIO WINGS BY MEANS OF A TUFT GRID. John D. Bird and Donald R. Riley. May 1952. 32p. photos., diags., tab. (NACA TN 2674)

## AERODYNAMICS

### 50 WINGS (1.2)

#### Wake - Complete Wings (Cont.)

FLOW STUDIES IN THE VICINITY OF A MODIFIED FLAT-PLATE RECTANGULAR WING OF ASPECT RATIO 0.25. William H. Michael, Jr. September 1952. 33p. diagrs., photos. (NACA TN 2790)

THE NORMAL COMPONENT OF THE INDUCED VELOCITY IN THE VICINITY OF A LIFTING ROTOR AND SOME EXAMPLES OF ITS APPLICATION. Walter Castles, Jr. and Jacob Henri De Leeuw, Georgia Institute of Technology. March 1953. 38p. diagrs., 3 tabs. (NACA TN 2912)

#### BOUNDARY LAYER (1.2.2.8)

THE EFFECT OF BOUNDARY-LAYER CONTROL BY SUCTION AND OF SEVERAL HIGH-LIFT DEVICES ON THE AERODYNAMIC CHARACTERISTICS IN YAW OF A 47.5° SWEEPBACK WING-FUSELAGE COMBINATION. Jerome Pasamanick. October 28, 1948. 36p. diagrs., photo. (NACA RM L8E21) (Declassified from Restricted, 6/29/53)

THE EFFECT OF BOUNDARY-LAYER CONTROL BY SUCTION AND SEVERAL HIGH-LIFT DEVICES ON THE LONGITUDINAL AERODYNAMIC CHARACTERISTICS OF A 47.5° SWEEPBACK WING-FUSELAGE COMBINATION. Jerome Pasamanick and Anthony J. Proterra. November 4, 1948. 44p. diagrs., photo., 2 tabs. (NACA RM L8E18) (Declassified from Restricted, 6/29/53)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

FULL-SCALE INVESTIGATION OF BOUNDARY-LAYER CONTROL BY SUCTION THROUGH LEADING-EDGE SLOTS ON A WING-FUSELAGE CONFIGURATION HAVING 47.5° LEADING-EDGE SWEEP WITH AND WITHOUT FLAPS. Jerome Pasamanick and Thomas B. Sellers. April 5, 1950. 55p. diagrs., photo., 2 tabs. (NACA RM L50B15) (Declassified from Restricted, 6/29/53)

COMPARISON BETWEEN THEORY AND EXPERIMENT FOR WINGS AT SUPERSONIC SPEEDS. Walter G. Vincenti. 1951. ii, 11p. diagrs., photos. (NACA Rept. 1033. Formerly TN 2100)

ANALYSIS OF THE EFFECTS OF BOUNDARY-LAYER CONTROL ON THE TAKE-OFF AND POWER-OFF LANDING PERFORMANCE CHARACTERISTICS OF A LIAISON TYPE OF AIRPLANE. Elmer A. Horton, Laurence K. Loftin, Jr., Stanley F. Racisz and John H. Quinn, Jr. 1951. ii, 31p. diagrs. (NACA Rept. 1057. Formerly TN 1597; TN 2143)

INVESTIGATION OF NACA 64,2-432 AND 64,3-440 AIRFOIL SECTIONS WITH BOUNDARY-LAYER CONTROL AND AN ANALYTICAL STUDY OF THEIR POSSIBLE APPLICATIONS. Elmer A. Horton, Stanley F. Racisz and Nicholas J. Paradiso. July 1951. 40p. diagrs., photos., 2 tabs. (NACA TN 2405)

GENERALIZATION OF BOUNDARY-LAYER MOMENTUM-INTEGRAL EQUATIONS TO THREE-DIMENSIONAL FLOWS INCLUDING THOSE OF ROTATING SYSTEM. Artur Mager. 1952. ii, 16p. diagrs. (NACA Rept. 1067. Formerly TN 2310).

EFFECTS OF FINITE SPAN ON THE SECTION CHARACTERISTICS OF TWO 45° SWEEP-BACK WINGS OF ASPECT RATIO 6. Lynn W. Hunton. March 17, 1952. 34p. diagrs. (NACA RM A52A10) (Declassified from Restricted, 4/10/53)

INVESTIGATION OF THE EFFECTS OF VARIATIONS IN THE REYNOLDS NUMBER BETWEEN  $0.4 \times 10^6$  AND  $3.0 \times 10^6$  ON THE LOW-SPEED AERODYNAMIC CHARACTERISTICS OF THREE LOW-ASPECT-RATIO SYMMETRICAL WINGS WITH RECTANGULAR PLAN FORMS. George W. Jones, Jr. September 1952. 13p. diagrs. (NACA RM L52G18)

LAMINAR BOUNDARY LAYER ON CONE IN SUPERSONIC FLOW AT LARGE ANGLE OF ATTACK. Franklin K. Moore. Appendix B: NUMERICAL SOLUTION OF DIFFERENTIAL EQUATIONS. Lynn Albers. November 1952. 34p. diagrs. (NACA TN 2844)

#### Control (1.2.2.8.2)

EFFECTS OF BOUNDARY-LAYER CONTROL ON THE LONGITUDINAL CHARACTERISTICS OF A 45° SWEEP-FORWARD WING-FUSELAGE COMBINATION. Gerald M. McCormack and Woodrow L. Cook. February 2, 1950. 73p. diagrs., photo., 2 tabs. (NACA RM A9K02a) (Declassified from Restricted, 6/29/53)

INVESTIGATIONS OF THE BOUNDARY-LAYER CONTROL OF A FULL SCALE SWEEP WING WITH AIR BLED OFF FROM THE TURBOJET. (Recherches sur l'Hypersustentation d'une Aile en Flèche Réelle par Contrôle de la Couche Limite Utilisant le Prélèvement d'Air sur le Turbo-Reacteur). P. Rebuffet and Ph. Poisson-Quinton. April 1952. 43p. diagrs., photos. (NACA TM 1331. Trans. from Recherche Aéronautique, no.14, March-April, 1950, p.39-54)

## Bodies

### (1.3)

WIND-TUNNEL INVESTIGATION OF THE STABILITY OF JETTISONED NOSE SECTIONS OF THE D-558 AIRPLANE - PHASES I AND II. Stanley H. Scher. January 14, 1948. 33p. photos., diagrs., 6 tabs. (NACA RM L7K10) (Declassified from Confidential, 9/16/52)

AN ANALYSIS OF BASE PRESSURE AT SUPERSONIC VELOCITIES AND COMPARISON WITH EXPERIMENT. Dean R. Chapman. 1951. ii, 23p. diagrs., photos. (NACA Rept. 1051. Formerly TN 2137)

EXPERIMENTAL INVESTIGATION OF THE PRESSURE DISTRIBUTION ABOUT A YAWED CIRCULAR CYLINDER IN THE CRITICAL REYNOLDS NUMBER RANGE. William J. Burnshall and Laurence K. Loftin, Jr. September 1951. 34p. diagrs. (NACA TN 2463)

ON ROTATIONAL CONICAL FLOW. (Sui Moti Conici Rotazionali). Carlo Ferrari. February 1952. 12p. diagrs. (NACA TM 1333. Trans. from Onore di Modesto Panetti, November 25, 1950).

ON THE CALCULATION OF FLOW ABOUT OBJECTS TRAVELING AT HIGH SUPERSONIC SPEEDS. A. J. Eggers, Jr. October 1952. 25p. diagrs. (NACA TN 2811)

A LOW-SPEED EXPERIMENTAL STUDY OF THE DIRECTIONAL CHARACTERISTICS OF A SHARP-NOSED FUSELAGE THROUGH A LARGE ANGLE-OF-ATTACK RANGE AT ZERO ANGLE OF SIDE-SLIP. William Letko. March 1953. 27p. diagrs., photo. (NACA TN 2911. Formerly RM L52J14)

THE ZERO-LIFT DRAG OF A SLENDER BODY OF REVOLUTION (NACA RM-10 RESEARCH MODEL) AS DETERMINED FROM TESTS IN SEVERAL WIND TUNNELS AND IN FLIGHT AT SUPERSONIC SPEEDS. Albert J. Evans. April 1953. 40p. diagrs., tab. (NACA TN 2944)

## THEORY

### (1.3.1)

PRESSURE DISTRIBUTIONS ON THIN CONICAL BODY OF ELLIPTIC CROSS SECTION AT MACH NUMBER 1.89. Stephen H. Maslen. January 20, 1949. 18p. diagrs., photo. (NACA RM E8K05) (Declassified from Confidential, 6/11/53)

ESTIMATION OF THE FORCES AND MOMENTS ACTING ON INCLINED BODIES OF REVOLUTION OF HIGH FINENESS RATIO. H. Julian Allen. November 14, 1949. 27p. diagrs. (NACA RM A9I26) (Declassified from Restricted, 6/11/53)

APPROXIMATE RELATIVE-TOTAL-PRESSURE LOSSES OF AN INFINITE CASCADE OF SUPERSONIC BLADES WITH FINITE LEADING-EDGE THICKNESS. John F. Klapproth. March 3, 1950. 8p. diagrs. (NACA RM E9L21) (Declassified from Restricted, 4/13/53)

EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF VISCOSITY ON THE DRAG AND BASE PRESSURE OF BODIES OF REVOLUTION AT A MACH NUMBER OF 1.5. Dean R. Chapman and Edward W. Perkins. 1951. ii, 24p. photos., diagrs. (NACA Rept. 1036. Formerly NACA RM A7A31a)

THE METHOD OF CHARACTERISTICS FOR THE DETERMINATION OF SUPERSONIC FLOW OVER BODIES OF REVOLUTION AT SMALL ANGLES OF ATTACK. Antonio Ferri. 1951. ii, 16p. diagrs. (NACA Rept. 1044. Formerly TN 1809)

SUPERSONIC FLOW AROUND CIRCULAR CONES AT ANGLES OF ATTACK. Antonio Ferri. 1951. ii, 11p. diagrs. (NACA Rept. 1045. Formerly TN 2236)

A STUDY OF EFFECTS OF VISCOSITY ON FLOW OVER SLENDER INCLINED BODIES OF REVOLUTION. H. Julian Allen and Edward W. Perkins. 1951. ii, 13p. diagrs., photos. (NACA Rept. 1048. Formerly TN 2044)

APPLICABILITY OF THE HYPERSONIC SIMILARITY RULE TO PRESSURE DISTRIBUTIONS WHICH INCLUDE THE EFFECTS OF ROTATION FOR BODIES OF REVOLUTION AT ZERO ANGLE OF ATTACK. Vernon J. Rossow. (Extension of TN 2250) June 1951. 28p. diagrs. (NACA TN 2399)

FLOW SEPARATION AHEAD OF BLUNT BODIES AT SUPERSONIC SPEEDS. W. E. Moeckel. July 1951. 39p. diagrs., photos. (NACA TN 2418)

ON THE ATTACHED CURVED SHOCK IN FRONT OF A SHARP-NOSED AXIALLY SYMMETRICAL BODY PLACED IN A UNIFORM STREAM: S. F. Shen and C. C. Lin, Massachusetts Institute of Technology. October 1951. 66p. diagrs. 2 tabs. (NACA TN 2505)

THE LINEARIZED CHARACTERISTICS METHOD AND ITS APPLICATION TO PRACTICAL NON-LINEAR SUPERSONIC PROBLEMS. Antonio Ferri. October 1951. 65p. diagrs. (NACA TN 2515)

## AERODYNAMICS

### 52 BODIES (1.3)

#### Theory - Bodies (Cont.)

LAMINAR BOUNDARY LAYER ON A CIRCULAR CONE IN SUPERSONIC FLOW AT A SMALL ANGLE OF ATTACK. Franklin K. Moore. October 1951. 44p. diagrs., tab. (NACA TN 2521)

MINIMUM WAVE DRAG OF BODIES OF REVOLUTION WITH A CYLINDRICAL CENTER SECTION. Franklyn B. Fuller and Benjamin R. Briggs. October 1951. 34p. diagrs. (NACA TN 2535)

DETERMINATION OF SHAPES OF BOATTAIL BODIES OF REVOLUTION FOR MINIMUM WAVE DRAG. Mac C. Adams. November 1951. 20p. diagrs. (NACA TN 2550)

APPROXIMATE METHODS FOR CALCULATING THE FLOW ABOUT NONLIFTING BODIES OF REVOLUTION AT HIGH SUPERSONIC AIRSPEEDS. A. J. Eggers, Jr. and Raymond C. Savin. December 1951. 40p. diagrs. (NACA TN 2579)

A STUDY OF SECOND-ORDER SUPERSONIC FLOW THEORY. Milton D. Van Dyke. 1952. ii, 23p. diagrs. (NACA Rept. 1081. Formerly TN 2200)

ORIENTATION OF ORIFICES ON BODIES OF REVOLUTION FOR DETERMINATION OF STREAM STATIC PRESSURE AT SUPERSONIC SPEEDS. Morton Cooper and Clyde V. Hamilton. January 1952. 26p. diagrs., photo., tab. (NACA TN 2592)

EXPERIMENTAL STUDY OF ISOTHERMAL WAKE-FLOW CHARACTERISTICS OF VARIOUS FLAME-HOLDER SHAPES. George G. Younger, David S. Gabriel and William R. Mickelsen. January 1952. 45p. diagrs., photos., 2 tabs. (NACA RM E51K07)

ON ROTATIONAL CONICAL FLOW. (Sui Moti Conici Rotazionali). Carlo Ferrari. February 1952. 12p. diagrs. (NACA TM 1333. Trans. from Onore di Modesto Panetti, November 25, 1950).

SUPERSONIC CONICAL FLOW. Stephen H. Maslen, Brown University. March 1952. 32p. diagrs., tab. (NACA TN 2651)

APPROXIMATE THEORY FOR CALCULATION OF LIFT OF BODIES, AFTERBODIES, AND COMBINATIONS OF BODIES. Barry Moskowitz. April 1952. 39p. diagrs. (NACA TN 2669)

A VECTOR STUDY OF LINEARIZED SUPERSONIC FLOW APPLICATIONS TO NONPLANAR PROBLEMS. John C. Martin. June 1952. 81p. diagrs., tab. (NACA TN 2641)

DISPLACEMENT EFFECT OF A THREE-DIMENSIONAL BOUNDARY LAYER. Franklin K. Moore. June 1952. 15p. diagrs. (NACA TN 2722)

THE EFFECT OF HIGH VISCOSITY ON THE FLOW AROUND A CYLINDER AND AROUND A SPHERE. (Der Einfluss grosser Zähigkeit bei der Strömung um den Zylinder und um die Kugel). F. Homann. June 1952. 29p. diagrs., tab. (NACA TM 1334. Trans. from Zeitschrift für angewandte Mathematik und Mechanik, v. 16, no. 3, June 1936, p. 153-164).

PRACTICAL CALCULATION OF SECOND-ORDER SUPERSONIC FLOW PAST NONLIFTING BODIES OF REVOLUTION. Milton D. Van Dyke. July 1952. 62p. diagrs., 2 tabs., 2 charts. (NACA TN 2744)

ACCURACY OF APPROXIMATE METHODS FOR PREDICTING PRESSURES ON POINTED NONLIFTING BODIES OF REVOLUTION IN SUPERSONIC FLOW. Dorris M. Ehret. August 1952. 26p. diagrs. (NACA TN 2764)

CORRECTIONS FOR DRAG, LIFT, AND MOMENT OF AN AXIALLY SYMMETRICAL BODY PLACED IN A SUPERSONIC TUNNEL HAVING A TWO-DIMENSIONAL PRESSURE GRADIENT. I. J. Kolodner, F. Reiche and H. F. Ludloff, New York University. November 1952. 45p. (NACA TN 2837)

LAMINAR BOUNDARY LAYER ON CONE IN SUPERSONIC FLOW AT LARGE ANGLE OF ATTACK. Franklin K. Moore. Appendix B: NUMERICAL SOLUTION OF DIFFERENTIAL EQUATIONS. Lynn Albers. November 1952. 34p. diagrs. (NACA TN 2844)

## SHAPE VARIABLES

### (1.3.2)

HIGH-SPEED WIND-TUNNEL INVESTIGATION OF A FLYING-BOAT HULL WITH HIGH LENGTH-BEAM RATIO. John M. Riebe and Rodger L. Naeseth. June 20, 1948. 30p. diagrs., photo., 4 tabs. (NACA RM L7K28) (Declassified from Restricted, 2/28/52)

EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF VISCOSITY ON THE DRAG AND BASE PRESSURE OF BODIES OF REVOLUTION AT A MACH NUMBER OF 1.5. Dean R. Chapman and Edward W. Perkins. 1951. ii, 24p. photos., diagrs. (NACA Rept. 1036. Formerly NACA RM A7A31a)

COMPARISON OF THEORETICAL AND EXPERIMENTAL HEAT-TRANSFER CHARACTERISTICS OF BODIES OF REVOLUTION AT SUPERSONIC SPEEDS. Richard Scherrer. 1951. ii, 15p. diagrs., photo. (NACA Rept. 1055. Formerly RM A8L28; TN 1975; TN 2087; TN 2131; TN 2148)

DETERMINATION OF SHAPES OF BOATTAIL BODIES OF REVOLUTION FOR MINIMUM WAVE DRAG. Mac C. Adams. November 1951. 20p. diagrs. (NACA TN 2550)

AERODYNAMIC CHARACTERISTICS OF THREE DEEP-STEP PLANING-TAIL FLYING-BOAT HULLS AND A TRANSVERSE-STEP HULL WITH EXTENDED AFTERBODY. John M. Riebe and Rodger L. Naeseth. August 1952. diagrs., photos., 5 tabs. (NACA TN 2762. Formerly RM L8I27)

AN ANALYTICAL STUDY OF HEAT REQUIREMENTS FOR ICING PROTECTION OF RANDOMES. James P. Lewis. March 1953. 20p. diagrs. (NACA RM E53A22)

### FINENESS RATIO (1.3.2.1)

EXPERIMENTAL INVESTIGATION OF THE EFFECT OF VERTICAL-TAIL SIZE AND LENGTH AND OF FUSELAGE SHAPE AND LENGTH ON THE STATIC LATERAL STABILITY CHARACTERISTICS OF A MODEL WITH 45° SWEEPBACK WING AND TAIL SURFACES. M. J. Queijo and Walter D. Wolhart. 1951. ii, 29p. diagrs., photos., 4 tabs. (NACA Rept. 1049. Formerly TN 2168)

APPLICABILITY OF THE HYPERSONIC SIMILARITY RULE TO PRESSURE DISTRIBUTIONS WHICH INCLUDE THE EFFECTS OF ROTATION FOR BODIES OF REVOLUTION AT ZERO ANGLE OF ATTACK. Vernon J. Rossow. (Extension of TN 2250) June 1951. 28p. diagrs. (NACA TN 2399)

MINIMUM WAVE DRAG OF BODIES OF REVOLUTION WITH A CYLINDRICAL CENTER SECTION. Franklyn B. Fuller and Benjamin R. Briggs. October 1951. 34p. diagrs. (NACA TN 2535)

INFLUENCE OF WING AND FUSELAGE ON THE VERTICAL-TAIL CONTRIBUTION TO THE LOW-SPEED ROLLING DERIVATIVES OF MIDWING AIRPLANE MODELS WITH 45° SWEEPBACK SURFACES. Walter D. Wolhart. December 1951. 55p. diagrs., photo., 3 tabs. (NACA TN 2587)

A COMPARISON OF THE EXPERIMENTAL SUBSONIC PRESSURE DISTRIBUTIONS ABOUT SEVERAL BODIES OF REVOLUTION WITH PRESSURE DISTRIBUTIONS COMPUTED BY MEANS OF THE LINEARIZED THEORY. Clarence W. Matthews. February 1952. 52p. diagrs., tab. (NACA TN 2519. Formerly RM L9F28)

AERODYNAMIC CHARACTERISTICS OF A REFINED DEEP-STEP PLANING-TAIL FLYING-BOAT HULL WITH VARIOUS FOREBODY AND AFTERBODY SHAPES. John M. Riebe and Rodger L. Naeseth. June 1952. 48p. photos., diagrs., 8 tabs. (NACA TN 2489. Formerly RM L8F01)

### CROSS SECTION (1.3.2.2)

PRESSURE DISTRIBUTIONS ON THIN CONICAL BODY OF ELLIPTIC CROSS SECTION AT MACH NUMBER 1.89. Stephen H. Maslen. January 20, 1949. 18p. diagrs., photo. (NACA RM E8K05) (Declassified from Confidential, 6/11/53)

THE LINEARIZED CHARACTERISTICS METHOD AND ITS APPLICATION TO PRACTICAL NON-LINEAR SUPERSONIC PROBLEMS. Antonio Ferri. October 1951. 65p. diagrs. (NACA TN 2515)

### THICKNESS DISTRIBUTION (1.3.2.3)

EXPERIMENTAL INVESTIGATION OF THE EFFECT OF VERTICAL-TAIL SIZE AND LENGTH AND OF FUSELAGE SHAPE AND LENGTH ON THE STATIC LATERAL STABILITY CHARACTERISTICS OF A MODEL WITH 45° SWEEPBACK WING AND TAIL SURFACES. M. J. Queijo and Walter D. Wolhart. 1951. ii, 29p. diagrs., photos., 4 tabs. (NACA Rept. 1049. Formerly TN 2168)

MINIMUM WAVE DRAG OF BODIES OF REVOLUTION WITH A CYLINDRICAL CENTER SECTION. Franklyn B. Fuller and Benjamin R. Briggs. October 1951. 34p. diagrs. (NACA TN 2535)

### SURFACE CONDITIONS (1.3.2.4)

INVESTIGATION OF TWO PITOT-STATIC TUBES AT SUPERSONIC SPEEDS. Lowell E. Hasel and Donald E. Coletti. November 19, 1948. 24p. diagrs. (NACA RM L8I02) (Declassified from Confidential, 6/4/52)

PRESSURE DISTRIBUTIONS ON THIN CONICAL BODY OF ELLIPTIC CROSS SECTION AT MACH NUMBER 1.89. Stephen H. Maslen. January 20, 1949. 18p. diagrs., photo. (NACA RM E8K05) (Declassified from Confidential, 6/11/53)

COMPARISON OF THEORETICAL AND EXPERIMENTAL HEAT-TRANSFER CHARACTERISTICS OF BODIES OF REVOLUTION AT SUPERSONIC SPEEDS. Richard Scherrer. 1951. ii, 15p. diagrs., photo. (NACA Rept. 1055. Formerly RM A8L28; TN 1975; TN 2087; TN 2131; TN 2148)

CORRECTIONS FOR DRAG, LIFT, AND MOMENT OF AN AXIALLY SYMMETRICAL BODY PLACED IN A SUPERSONIC TUNNEL HAVING A TWO-DIMENSIONAL PRESSURE GRADIENT. I. J. Kolodner, F. Reiche and H. F. Ludloff, New York University. November 1952. 45p. (NACA TN 2837)

### PROTUBERANCES (1.3.2.5)

A LOW-SPEED EXPERIMENTAL STUDY OF THE DIRECTIONAL CHARACTERISTICS OF A SHARP-NOSED FUSELAGE THROUGH A LARGE ANGLE-OF-ATTACK RANGE AT ZERO ANGLE OF SIDE-SLIP. William Letko. March 1953. 27p. diagrs., photo. (NACA TN 2911. Formerly RM L52J14)

### DUCTED BODIES (1.3.4)

PRELIMINARY INVESTIGATION OF CONE-TYPE DIFFUSERS DESIGNED FOR MINIMUM SPILLAGE AT INLET. Roger W. Luidens and Henry Hunczak. May 3, 1948. 31p. photos., diagrs. (NACA RM E7K19) (Declassified from Confidential, 6/11/53)

CONCERNING THE FLOW ABOUT RING-SHAPED COWLINGS. PART VIII - FURTHER MEASUREMENTS ON ANNULAR PROFILES. (Über die Strömung an ringförmigen Verkleidungen. VIII Mitteilung: Weitere Messungen an Ringprofilen). Dietrich Küchemann and Johanna Weber. February 1952. 11p. diagrs. (NACA TM 1328. Trans from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1236/8, March 25, 1943).

NOSE SHAPE  
(1.3.4.1)

WIND-TUNNEL INVESTIGATION OF WING INLETS FOR A FOUR-ENGINE AIRPLANE. Walter A. Bartlett, Jr. and Edwin B. Goral. March 11, 1947. 65p. diags., photos., 7 tabs. (NACA RM L6L11) (Declassified from Restricted, 9/16/52)

THEORETICAL AND EXPERIMENTAL ANALYSIS OF LOW-DRAG SUPERSONIC INLETS HAVING A CIRCULAR CROSS SECTION AND A CENTRAL BODY AT MACH NUMBERS OF 3.30, 2.75, AND 2.45. Antonio Ferri and Louis M. Nucci. November 10, 1948. 89p. photos., diags. (NACA RM L8H13) (Declassified from Confidential, 4/13/53)

WIND-TUNNEL INVESTIGATION OF AIR INLET AND OUTLET OPENINGS ON A STREAMLINE BODY. John V. Becker. 1951. ii, 21p. diags., photos., 3 tabs. (NACA Rept. 1038. Formerly ACR, November 1940)

THE METHOD OF CHARACTERISTICS FOR THE DETERMINATION OF SUPERSONIC FLOW OVER BODIES OF REVOLUTION AT SMALL ANGLES OF ATTACK. Antonio Ferri. 1951. ii, 16p. diags. (NACA Rept. 1044. Formerly TN 1809)

TAIL SHAPE  
(1.3.4.2)

WIND-TUNNEL INVESTIGATION OF AIR INLET AND OUTLET OPENINGS ON A STREAMLINE BODY. John V. Becker. 1951. ii, 21p. diags., photos., 3 tabs. (NACA Rept. 1038. Formerly ACR, November 1940)

AN INVESTIGATION OF THE EFFECTS OF JET-OUTLET CUTOFF ANGLE ON THRUST DIRECTION AND BODY PITCHING MOMENT. James R. Blackaby. June 1951. 39p. diags., photos., tab. (NACA TN 2379)

SIDE INLETS  
(1.3.4.3)

PRESSURE-DISTRIBUTION AND RAM-RECOVERY CHARACTERISTICS OF NACA SUBMERGED INLETS AT HIGH SUBSONIC SPEEDS. Joseph L. Frank. July 7, 1950. 41p. diags., photo. (NACA RM A50E02) (Declassified from Confidential, 6/11/53)

HULLS  
(1.3.5)

HIGH-SPEED WIND-TUNNEL INVESTIGATION OF A FLYING-BOAT HULL WITH HIGH LENGTH-BEAM RATIO. John M. Riebe and Rodger L. Naeseth. June 20, 1948. 30p. diags., photo., 4 tabs. (NACA RM L7K28) (Declassified from Restricted, 2/28/52)

AERODYNAMIC CHARACTERISTICS OF AN AIRFOIL-FOREBODY SWEEP FLYING-BOAT HULL WITH A WING AND TAIL SWEEP BACK  $51.3^\circ$  AT THE LEADING EDGE. Rodger L. Naeseth and Richard G. MacLeod. September 9, 1949. 27p. diags., photo., tab. (NACA RM L9F08) (Declassified from Confidential, 6/11/53)

AERODYNAMIC CHARACTERISTICS OF A REFINED DEEP-STEP PLANING-TAIL FLYING-BOAT HULL WITH VARIOUS FOREBODY AND AFTERBODY SHAPES. John M. Riebe and Rodger L. Naeseth. June 1952. 48p. photos., diags., 8 tabs. (NACA TN 2489. Formerly RM L8F01)

AERODYNAMIC CHARACTERISTICS OF THREE DEEP-STEP PLANING-TAIL FLYING-BOAT HULLS AND A TRANSVERSE-STEP HULL WITH EXTENDED AFTERBODY. John M. Riebe and Rodger L. Naeseth. August 1952. diags., photos., 5 tabs. (NACA TN 2762. Formerly RM L8I27)

## Internal Aerodynamics (1.4)

A GENERAL THEORY OF THREE-DIMENSIONAL FLOW IN SUBSONIC AND SUPERSONIC TURBOMACHINES OF AXIAL-, RADIAL-, AND MIXED-FLOW TYPES. Chung-Hua Wu. January 1952. 93p. diagrs., tab. (NACA TN 2604)

AN APPROXIMATE METHOD OF DETERMINING THE SUBSONIC FLOW IN AN ARBITRARY STREAM FILAMENT OF REVOLUTION CUT BY ARBITRARY TURBOMACHINE BLADES. Chung-Hua Wu, Curtis A. Brown and Vasily D. Prian. June 1952. 46p. diagrs., 4 tabs. (NACA TN 2702)

TWO-DIMENSIONAL SHEAR FLOW IN A 90° ELBOW. James J. Kramer and John D. Stanitz. July 1952. 44p. diagrs. (NACA TN 2736)

A STUDY OF THE TRANSIENT BEHAVIOR OF SHOCK WAVES IN TRANSONIC CHANNEL FLOWS. Robert V. Hess. October 1952. 32p. diagrs. (NACA TN 2797)

CONVECTION OF A PATTERN OF VORTICITY THROUGH A SHOCK WAVE. H. S. Ribner. January 1953. ii, 48p. diagrs. (NACA TN 2864)

UNSTEADY OBLIQUE INTERACTION OF A SHOCK WAVE WITH A PLANE DISTURBANCE. Franklin K. Moore. January 1953. 66p. diagrs. (NACA TN 2879)

### AIR INLETS (1.4.1)

THEORETICAL AND EXPERIMENTAL INVESTIGATION OF ADDITIVE DRAG. Merwin Sibulkin. May 21, 1951. 33p. diagrs. (NACA RM E51B13) (Declassified from Confidential, 6/11/53)

METHOD AND GRAPHS FOR THE EVALUATION OF AIR-INDUCTION SYSTEMS. George B. Brajnikoff. April 1952. 41p. diagrs., tab. (NACA TN 2697)

### NOSE, CENTRAL (1.4.1.1)

THEORETICAL AND EXPERIMENTAL ANALYSIS OF LOW-DRAG SUPERSONIC INLETS HAVING A CIRCULAR CROSS SECTION AND A CENTRAL BODY AT MACH NUMBERS OF 3.30, 2.75, AND 2.45. Antonio Ferri and Louis M. Nucci. November 10, 1948. 89p. photos., diagrs. (NACA RM L8H13) (Declassified from Confidential, 4/13/53)

WIND-TUNNEL INVESTIGATION OF AIR INLET AND OUTLET OPENINGS ON A STREAMLINE BODY. John V. Becker. 1951. ii, 21p. diagrs., photos., 3 tabs. (NACA Rept. 1038. Formerly ACR, November 1940)

FLOW SEPARATION AHEAD OF BLUNT BODIES AT SUPERSONIC SPEEDS. W. E. Moeckel. July 1951. 39p. diagrs., photos. (NACA TN 2418)

CONCERNING THE FLOW ABOUT RING-SHAPED COWLINGS. PART II - ANNULAR BODIES OF INFINITE LENGTH WITH CIRCULATION FOR SMOOTH ENTRANCE. (Über die Strömung an ringförmigen Verkleidungen. II. Mitteilung: Ringkörper unendlicher Tiefe mit Zirkulation bei stossfreiem Eintritt). Dietrich Kuchemann and Johanna Weber. November 1951. 41p. diagrs. (NACA TM 1326. Trans. from Zentrale für wissenschaftliches Berichtswesen über Luftfahrtforschung, Berlin. FB 1236/2, November 11, 1940).

CONCERNING THE FLOW ABOUT RING-SHAPED COWLINGS. PART VI - FURTHER MEASUREMENTS ON INLET DEVICES. (Über die Strömung an ringförmigen Verkleidungen. VI. Mitteilung: Weitere Messungen an Einlaufgeräten). Dietrich Kuchemann and Johanna Weber. December 1951. 21p. diagrs. (NACA TM 1327. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1236/6, March 30, 1942).

CONCERNING THE FLOW ABOUT RING-SHAPED COWLINGS OF FINITE THICKNESS. Part I. (Über die Strömung an ringförmigen Verkleidungen endlicher Dicke). Dietrich Kuchemann. January 1952. 24p. diagrs. (NACA TM 1325. Trans. from Zentrale für wissenschaftliches Berichtswesen über Luftfahrtforschung, Berlin. FB 1236, June 13, 1940).

CONCERNING THE FLOW ABOUT RING-SHAPED COWLINGS. PART IX - THE INFLUENCE OF OBLIQUE ONCOMING FLOW ON THE INCREMENTAL VELOCITIES AND AIR FORCES AT THE FRONT PART OF CIRCULAR COWLS. (Über die Strömung an ringförmigen Verkleidungen. IX. Mitteilung: Der Einfluss der Schräganblasung auf die Uebergeschwindigkeiten und Luftkräfte am vorderen Teil von Ringhauben). Dietrich Kuchemann and Johanna Weber. February 1952. 16p. diagrs. (NACA TM 1329) Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1236/9; Aerodynamische Versuchsanstalt Göttingen E. V. Institut für theoretische Aerodynamik. (Bericht) 43/A/10. June 10, 1943).



Subsonic  
(1.4.1.1.2)

A LOW-SPEED INVESTIGATION OF AN ANNULAR TRANSONIC AIR INLET. Mark R. Nichols and Donald W. Rinkoski. April 1952. 38p. diagrs., photos. (NACA TN 2685. Formerly RM L6J04)

Supersonic  
(1.4.1.1.3)

CHARACTERISTICS OF PERFORATED DIFFUSERS AT FREE-STREAM MACH NUMBER 1.90. Henry R. Hunczak and Emil J. Kremzier. May 8, 1950. 69p. diagrs., photos. (NACA RM E50B02) (Declassified from Confidential, 6/11/53)

AN INVESTIGATION OF CONVERGENT-DIVERGENT DIFFUSERS AT MACH NUMBER 1.85. DeMarquis D. Wyatt and Henry R. Hunczak. February 2, 1951. 60p. diagrs., photos., tab. (NACA RM E50K07) (Declassified from Restricted, 6/11/53)

THE USE OF PERFORATED INLETS FOR EFFICIENT SUPERSONIC DIFFUSION. John C. Evvard and John W. Blakey. (Revised) April 13, 1951. 36p. diagrs., photo. (NACA RM E51B10) (Declassified from Restricted, 6/11/53)

FLOW SEPARATION AHEAD OF BLUNT BODIES AT SUPERSONIC SPEEDS. W. E. Moeckel. July 1951. 39p. diagrs., photos. (NACA TN 2418)

A LOW-SPEED INVESTIGATION OF AN ANNULAR TRANSONIC AIR INLET. Mark R. Nichols and Donald W. Rinkoski. April 1952. 38p. diagrs., photos. (NACA TN 2685. Formerly RM L6J04)

NOSE, ANNULAR  
(1.4.1.2)

PRELIMINARY INVESTIGATION OF CONE-TYPE DIFFUSERS DESIGNED FOR MINIMUM SPILLAGE AT INLET. Roger W. Luidens and Henry Hunczak. May 3, 1948. 31p. photos., diagrs. (NACA RM E7K19) (Declassified from Confidential, 6/11/53)

EFFECT OF RAM-JET PRESSURE PULSATIONS ON SUPERSONIC-DIFFUSER PERFORMANCE. James F. Connors. November 20, 1950. 29p. photos., diagrs. (NACA RM E50H22) (Declassified from Confidential, 6/11/53)

WIND-TUNNEL INVESTIGATION OF AIR INLET AND OUTLET OPENINGS ON A STREAMLINE BODY. John V. Becker. 1951. ii, 21p. diagrs., photos., 3 tabs. (NACA Rept. 1038. Formerly ACR, November 1940)

CONCERNING THE FLOW ABOUT RING-SHAPED COWLINGS. PART II - ANNULAR BODIES OF INFINITE LENGTH WITH CIRCULATION FOR SMOOTH ENTRANCE. (Über die Strömung an ringförmigen Verkleidungen. II. Mitteilung: Ringkörper unendlicher Tiefe mit Zirkulation bei stossfreiem Eintritt). Dietrich Kuchemann and Johanna Weber. November 1951. 41p. diagrs. (NACA TM 1326. Trans. from Zentrale für wissenschaftliches Berichtswesen über Luftfahrtforschung, Berlin. FB 1236/2, November 11, 1940).

CONCERNING THE FLOW ABOUT RING-SHAPED COWLINGS. PART VI - FURTHER MEASUREMENTS ON INLET DEVICES. (Über die Strömung an ringförmigen Verkleidungen. VI. Mitteilung: Weitere Messungen an Einlaufgeräten). Dietrich Kuchemann and Johanna Weber. December 1951. 21p. diagrs. (NACA TM 1327. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1236/6, March 30, 1942).

CONCERNING THE FLOW ABOUT RING-SHAPED COWLINGS OF FINITE THICKNESS. Part I. (Über die Strömung an ringförmigen Verkleidungen endlicher Dicke). Dietrich Kuchemann. January 1952. 24p. diagrs. (NACA TM 1325. Trans. from Zentrale für wissenschaftliches Berichtswesen über Luftfahrtforschung, Berlin. FB 1236, June 13, 1940).

CONCERNING THE FLOW ABOUT RING-SHAPED COWLINGS. PART VIII - FURTHER MEASUREMENTS ON ANNULAR PROFILES. (Über die Strömung an ringförmigen Verkleidungen. VIII. Mitteilung: Weitere Messungen an Ringprofilen). Dietrich Kuchemann and Johanna Weber. February 1952. 11p. diagrs. (NACA TM 1328. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1236/8, March 25, 1943).

CONCERNING THE FLOW ABOUT RING-SHAPED COWLINGS. PART IX - THE INFLUENCE OF OBLIQUE ONCOMING FLOW ON THE INCREMENTAL VELOCITIES AND AIR FORCES AT THE FRONT PART OF CIRCULAR COWLS. (Über die Strömung an ringförmigen Verkleidungen. IX. Mitteilung: Der Einfluss der Schräganblasung auf die Uebergeschwindigkeiten und Luftkräfte am vorderen Teil von Ringhauben). Dietrich Kuchemann and Johanna Weber. February 1952. 16p. diagrs. (NACA TM 1329) Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1236/9; Aerodynamische Versuchsanstalt Göttingen E. V. Institut für theoretische Aerodynamik. (Bericht) 43/A/10. June 10, 1943).

A LOW-SPEED INVESTIGATION OF AN ANNULAR TRANSONIC AIR INLET. Mark R. Nichols and Donald W. Rinkoski. April 1952. 38p. diagrs., photos. (NACA TN 2685. Formerly RM L6J04)

WING LEADING EDGE  
(1.4.1.3)

WIND-TUNNEL INVESTIGATION OF WING INLETS FOR A FOUR-ENGINE AIRPLANE. Walter A. Bartlett, Jr. and Edwin B. Goral. March 11, 1947. 65p. diagrs., photos., 7 tabs. (NACA RM L6L11) (Declassified from Restricted, 9/16/52)

DEVELOPMENT OF NACA SUBMERGED INLETS AND A COMPARISON WITH WING LEADING-EDGE INLETS FOR A 1/4-SCALE MODEL OF A FIGHTER AIRPLANE. Emmet A. Mossman and Donald E. Gault. August 7, 1947. 41p. diagrs., photos. 11 tabs. (NACA RM A7A31) (Declassified from Restricted, 6/5/53)

## SIDE (1.4.1.4)

A LOW-SPEED INVESTIGATION OF A FUSELAGE-SIDE AIR INLET FOR USE AT TRANSONIC FLIGHT SPEEDS. Mark R. Nichols and Edwin B. Goral. April 1952. 60p. diagrs., photos., tab. (NACA TN 2684. Formerly RM L7A06)

### Scoops (1.4.1.4.1)

A LOW-SPEED INVESTIGATION OF A FUSELAGE-SIDE AIR INLET FOR USE AT TRANSONIC FLIGHT SPEEDS. Mark R. Nichols and Edwin B. Goral. April 1952. 60p. diagrs., photos., tab. (NACA TN 2684. Formerly RM L7A06)

A LOW-SPEED INVESTIGATION OF AN ANNULAR TRANSONIC AIR INLET. Mark R. Nichols and Donald W. Rinkoski. April 1952. 38p. diagrs., photos. (NACA TN 2685. Formerly RM L6J04)

### Submerged (1.4.1.4.2)

AN EXPERIMENTAL INVESTIGATION OF NACA SUBMERGED-DUCT ENTRANCES. Charles W. Frick, Wallace F. Davis, Lauros M. Randall and Emmet A. Mossman. October 1945. 56p. diagrs., photos., 3 tabs. (NACA ACR 5120) (Reclassified from Restricted, 7/3/51)

DEVELOPMENT OF NACA SUBMERGED INLETS AND A COMPARISON WITH WING LEADING-EDGE INLETS FOR A 1/4-SCALE MODEL OF A FIGHTER AIRPLANE. Emmet A. Mossman and Donald E. Gault. August 7, 1947. 41p. diagrs., photos. 11 tabs. (NACA RM A7A31) (Declassified from Restricted, 6/5/53)

TESTS OF SUBMERGED DUCT INSTALLATION ON A MODIFIED FIGHTER AIRPLANE IN THE AMES 40- BY 80-FOOT WIND TUNNEL. Norman J. Martin. December 11, 1947. 25p. diagrs., photos., 2 tabs. (NACA RM A7I29) (Declassified from Confidential, 6/5/53)

PRESSURE-DISTRIBUTION AND RAM-RECOVERY CHARACTERISTICS OF NACA SUBMERGED INLETS AT HIGH SUBSONIC SPEEDS. Joseph L. Frank. July 7, 1950. 41p. diagrs., photo. (NACA RM A50E02) (Declassified from Confidential, 6/11/53)

THEORETICAL INVESTIGATION OF SUBMERGED INLETS AT LOW SPEEDS. Alvin H. Sacks and John R. Spreiter. August 1951. 48p. diagrs., photos. (NACA TN 2323)

## DUCTS (1.4.2)

WIND-TUNNEL INVESTIGATION OF WING INLETS FOR A FOUR-ENGINE AIRPLANE. Walter A. Bartlett, Jr. and Edwin B. Goral. March 11, 1947. 65p. diagrs., photos., 7 tabs. (NACA RM L6L11) (Declassified from Restricted, 9/16/52)

PRELIMINARY INVESTIGATION OF CONE-TYPE DIFFUSERS DESIGNED FOR MINIMUM SPILLAGE AT INLET. Roger W. Luidens and Henry Hunczak. May 3, 1948. 31p. photos., diagrs. (NACA RM E7K19) (Declassified from Confidential, 6/11/53)

INVESTIGATION OF TURBULENT FLOW IN A TWO-DIMENSIONAL CHANNEL. John Laufer, California Institute of Technology. 1951. 20p. diagrs., photos. (NACA Rept. 1053. Formerly TN 2123)

PRELIMINARY STUDY OF STABILITY OF FLOW FROM TWO DUCTS DISCHARGING INTO A COMMON DUCT. Albert I. Bellin, D. Richard Messina and Paul B. Richards, Harvard University. July 1951. 33p. diagrs., photos. (NACA TN 2417)

DESIGN OF TWO-DIMENSIONAL CHANNELS WITH PRESCRIBED VELOCITY DISTRIBUTIONS ALONG THE CHANNEL WALLS. I - RELAXATION SOLUTIONS. John D. Stanitz. January 1952. 69p. diagrs., 6 tabs. (NACA TN 2593)

DESIGN OF TWO-DIMENSIONAL CHANNELS WITH PRESCRIBED VELOCITY DISTRIBUTIONS ALONG THE CHANNEL WALLS. II - SOLUTION BY GREEN'S FUNCTION. John D. Stanitz. January 1952. 35p. diagrs., 2 tabs. (NACA TN 2595)

COMBINED EFFECT OF DAMPING SCREENS AND STREAM CONVERGENCE ON TURBULENCE. Maurice Tucker. January 1953. i, 62p. diagrs., tab. (NACA TN 2878)

## DIFFUSERS (1.4.2.1)

PERFORMANCE OF A MIXED-FLOW IMPELLER IN COMBINATION WITH A SEMIVANELESS DIFFUSER. Eugene B. Laskin and Milton G. Kofskey. April 4, 1947. 17p. diagrs., photos. (NACA RM E7C05a) (Reclassified from Restricted, 7/3/51)

PRELIMINARY INVESTIGATION OF CONE-TYPE DIFFUSERS DESIGNED FOR MINIMUM SPILLAGE AT INLET. Roger W. Luidens and Henry Hunczak. May 3, 1948. 31p. photos., diagrs. (NACA RM E7K19) (Declassified from Confidential, 6/11/53)

THEORETICAL AND EXPERIMENTAL ANALYSIS OF LOW-DRAG SUPERSONIC INLETS HAVING A CIRCULAR CROSS SECTION AND A CENTRAL BODY AT MACH NUMBERS OF 3.30, 2.75, AND 2.45. Antonio Ferri and Louis M. Nucci. November 10, 1948. 89p. photos., diagrs. (NACA RM L8H13) (Declassified from Confidential, 4/13/53)

PERFORMANCE OF 24-INCH SUPERSONIC AXIAL-FLOW COMPRESSOR IN AIR. II - PERFORMANCE OF COMPRESSOR ROTOR AT EQUIVALENT TIP SPEEDS FROM 800 TO 1765 FEET PER SECOND. Irving A. Johnsen, Linwood C. Wright and Melvin J. Hartmann. January 21, 1949. 31p. diagrs. (NACA RM E8G01) (Declassified from Restricted, 4/13/53)

PERFORMANCE OF SUPERSONIC AXIAL-FLOW COMPRESSORS BASED ON ONE-DIMENSIONAL ANALYSIS. Linwood C. Wright and John F. Klapproth. March 25, 1949. 29p. diagrs. (NACA RM E8L10) (Declassified from Confidential, 3/28/52)

## AERODYNAMICS

### 58 INTERNAL (1.4)

#### *Diffusers - Ducts (Cont.)*

PRELIMINARY ANALYSIS OF AXIAL-FLOW COMPRESSORS HAVING SUPERSONIC VELOCITY AT THE ENTRANCE OF THE STATOR. Antonio Ferri. September 12, 1949. 36p. diags. (NACA RM L9G06) (Declassified from Confidential, 4/13/53)

INVESTIGATION OF HIGH-SUBSONIC PERFORMANCE CHARACTERISTICS OF A 12° 21-INCH CONICAL DIFFUSER, INCLUDING THE EFFECTS OF CHANGE IN INLET-BOUNDARY-LAYER THICKNESS. Martin R. Copp and Paul L. Klevatt. March 24, 1950. 51p. diags., photos. (NACA RM L9H10) (Declassified from Restricted, 6/11/53)

INVESTIGATION OF THE PRESSURE-RATIO REQUIREMENTS OF THE LANGLEY 11-INCH HYPERSONIC TUNNEL WITH A VARIABLE-GEOMETRY DIFFUSER. Mitchel H. Bertram. October 6, 1950. 19p. diags. (NACA RM L50H3) (Declassified from Confidential, 3/10/52)

A METHOD OF DESIGNING TURBOMACHINE BLADES WITH A DESIRABLE THICKNESS DISTRIBUTION FOR COMPRESSIBLE FLOW ALONG AN ARBITRARY STREAM FILAMENT OF REVOLUTION. Chung-Hua Wu and Curtis A. Brown. September 1951. 45p. diags., 6 tabs. (NACA TN 2455)

A PROCEDURE FOR CALCULATING THE DEVELOPMENT OF TURBULENT BOUNDARY LAYERS UNDER THE INFLUENCE OF ADVERSE PRESSURE GRADIENTS. Kennedy F. Rubert and Jerome Persh. September 1951. 61p. diags. (NACA TN 2478)

USE OF CHOKED NOZZLE TECHNIQUE AND EXHAUST JET DIFFUSER FOR EXTENDING OPERABLE RANGE OF JET-ENGINE RESEARCH FACILITIES. John H. Povolny. July 1952. 17p. diags. (NACA RM E52E12)

USE OF A CONSOLIDATED POROUS MEDIUM FOR MEASUREMENT OF FLOW RATE AND VISCOSITY OF GASES AT ELEVATED PRESSURES AND TEMPERATURES. Martin B. Biles and J. A. Putnam, University of California. September 1952. 51p. diags., photos., 7 tabs. (NACA TN 2783)

A STUDY OF THE TRANSIENT BEHAVIOR OF SHOCK WAVES IN TRANSONIC CHANNEL FLOWS. Robert V. Hess. October 1952. 32p. diags. (NACA TN 2797)

#### Subsonic (1.4.2.1.1)

THE EFFECT OF THE INLET MACH NUMBER AND INLET-BOUNDARY-LAYER THICKNESS ON THE PERFORMANCE OF A 23° CONICAL-DIFFUSER - TAIL-PIPE COMBINATION. Jerome Persh. March 21, 1950. 53p. diags. (NACA RM L9K10) (Declassified from Restricted, 6/11/53)

HIGH-SUBSONIC PERFORMANCE CHARACTERISTICS AND BOUNDARY-LAYER INVESTIGATIONS OF A 12° 10-INCH-INLET-DIAMETER CONICAL DIFFUSER. B. H. Little, Jr. and Stafford W. Wilbur. May 11, 1950. 62p. diags., photos. (NACA RM L50C02a) (Declassified from Restricted, 6/11/53)

SPECTRUM OF TURBULENCE IN A CONTRACTING STREAM. H. S. Ribner and M. Tucker. January 1952. 54p. diags., tab. (NACA TN 2606)

ONE-DIMENSIONAL COMPRESSIBLE FLOW IN VANELESS DIFFUSERS OF RADIAL- AND MIXED-FLOW CENTRIFUGAL COMPRESSORS, INCLUDING EFFECTS OF FRICTION, HEAT TRANSFER AND AREA CHANGE. John D. Stanitz. January 1952. 61p. diags., photo. (NACA TN 2610)

EXPERIMENTAL INVESTIGATION OF A 90° CASCADE DIFFUSING BEND WITH AN AREA RATIO OF 1.45:1 AND WITH SEVERAL INLET BOUNDARY LAYERS. Daniel Friedman and Willard R. Westphal. April 1952. 30p. diags., photos., 2 tabs. (NACA TN 2668)

COMBINED EFFECT OF DAMPING SCREENS AND STREAM CONVERGENCE ON TURBULENCE. Maurice Tucker. January 1953. 1, 62p. diags., tab. (NACA TN 2878)

PERFORMANCE CHARACTERISTICS OF PLANE-WALL TWO-DIMENSIONAL DIFFUSERS. Elliott G. Reid, Stanford University. February 1953. 1, 80p. diags., photos., 3 tabs. (NACA TN 2888)

#### Supersonic (1.4.2.1.2)

CHARACTERISTICS OF PERFORATED DIFFUSERS AT FREE-STREAM MACH NUMBER 1.90. Henry R. Hunczak and Emil J. Kremzier. May 8, 1950. 69p. diags., photos. (NACA RM E50B02) (Declassified from Confidential, 6/11/53)

EFFECT OF RAM-JET PRESSURE PULSATIONS ON SUPERSONIC-DIFFUSER PERFORMANCE. James F. Connors. November 20, 1950. 29p. photos., diags. (NACA RM E50H22) (Declassified from Confidential, 6/11/53)

AN INVESTIGATION OF CONVERGENT-DIVERGENT DIFFUSERS AT MACH NUMBER 1.85. DeMarquis D. Wyatt and Henry R. Hunczak. February 2, 1951. 60p. diags., photos., tab. (NACA RM E50K07) (Declassified from Restricted, 6/11/53)

THE USE OF PERFORATED INLETS FOR EFFICIENT SUPERSONIC DIFFUSION. John C. Evvard and John W. Blakey. (Revised) April 13, 1951. 36p. diags., photo. (NACA RM E51B10) (Declassified from Restricted, 6/11/53)

FLOW SEPARATION AHEAD OF BLUNT BODIES AT SUPERSONIC SPEEDS. W. E. Moerkel. July 1951. 39p. diags., photos. (NACA TN 2418)

SPECTRUM OF TURBULENCE IN A CONTRACTING STREAM. H. S. Ribner and M. Tucker. January 1952. 54p. diags., tab. (NACA TN 2606)

THREE-DIMENSIONAL SUPERSONIC NOZZLES AND INLETS OF ARBITRARY EXIT CROSS SECTION. John C. Evvard and Stephen H. Maslen. April 1952. 12p. diags. (NACA TN 2688)

METHOD AND GRAPHS FOR THE EVALUATION OF AIR-INDUCTION SYSTEMS. George B. Brajnikoff. April 1952. 41p. diags., tab. (NACA TN 2697)

**Supersonic - Ducts (Cont.)**

**SUPERSONIC FLOW WITH WHIRL AND VORTICITY IN AXISYMMETRIC CHANNELS.** Ralph J. Eschborn. August 1952. 41p. diagrs. (NACA TN 2768)

**STUDY OF THE PRESSURE RISE ACROSS SHOCK WAVES REQUIRED TO SEPARATE LAMINAR AND TURBULENT BOUNDARY LAYERS.** Coleman duP. Donaldson and Roy H. Lange. September 1952. 20p. diagrs., photos., tab. (NACA TN 2770. Formerly RM L52C21)

**COMBINED EFFECT OF DAMPING SCREENS AND STREAM CONVERGENCE ON TURBULENCE.** Maurice Tucker. January 1953. i, 62p. diagrs., tab. (NACA TN 2878)

**NOZZLES**  
**(1.4.2.2)**

**TEMPERATURE AND PRESSURE DISTRIBUTIONS IN DUAL PARALLEL JETS IMPINGING ON THE GROUND FROM A TURBOJET ENGINE.** J. Elmo Farmer, Francis S. Stepka and Floyd B. Garrett. February 20, 1950. 23p. diagrs., photo. (NACA RM E9L01) (Declassified from Confidential, 3/10/52)

**METHOD OF ANALYSIS FOR COMPRESSIBLE FLOW PAST ARBITRARY TURBOMACHINE BLADES ON GENERAL SURFACE OF REVOLUTION.** Chung-Hua Wu and Curtis A. Brown. July 1951. 42p. diagrs. (NACA TN 2407)

**SOME MEASUREMENTS OF THE EFFECT OF GASEOUS IMPERFECTIONS ON THE CRITICAL PRESSURE RATIO IN AIR AND THE SPEED OF SOUND IN NITROGEN.** Coleman duP. Donaldson and Jim J. Jones. August 1951. 15p. diagrs., photos., tab. (NACA TN 2437)

**METHOD OF MATCHING COMPONENTS AND PREDICTING PERFORMANCE OF A TURBINE-PROPELLER ENGINE.** Alois T. Sutor and Morris A. Zipkin. September 1951. 75p. diagrs. (NACA TN 2450)

**A METHOD OF DESIGNING TURBOMACHINE BLADES WITH A DESIRABLE THICKNESS DISTRIBUTION FOR COMPRESSIBLE FLOW ALONG AN ARBITRARY STREAM FILAMENT OF REVOLUTION.** Chung-Hua Wu and Curtis A. Brown. September 1951. 45p. diagrs., 6 tabs. (NACA TN 2455)

**A METHOD OF SOLVING THE DIRECT AND INVERSE PROBLEM OF SUPERSONIC FLOW ALONG ARBITRARY STREAM FILAMENTS OF REVOLUTION IN TURBOMACHINES.** Chung-Hua Wu and Eleanor L. Costilow. September 1951. 25p. diagrs. (NACA TN 2492)

**SPECTRUM OF TURBULENCE IN A CONTRACTING STREAM.** H. S. Ribner and M. Tucker. January 1952. 54p. diagrs., tab. (NACA TN 2606)

**THE ACHIEVEMENT OF CONTINUOUS WALL CURVATURE IN DESIGN OF TWO-DIMENSIONAL SYMMETRICAL SUPERSONIC NOZZLES.** J. C. Evvard and Lawrence R. Marcus. January 1952. 8p. diagrs. (NACA TN 2616)

**THREE-DIMENSIONAL SUPERSONIC NOZZLES AND INLETS OF ARBITRARY EXIT CROSS SECTION.** John C. Evvard and Stephen H. Maslen. April 1952. 12p. diagrs. (NACA TN 2688)

**A SURVEY OF THE AIRCRAFT-NOISE PROBLEM WITH SPECIAL REFERENCE TO ITS PHYSICAL ASPECTS.** Harvey H. Hubbard. May 1952. 41p. diagrs., photos. (NACA TN 2701)

**THE AERODYNAMIC DESIGN OF HIGH MACH NUMBER NOZZLES UTILIZING AXISYMMETRIC FLOW WITH APPLICATION TO A NOZZLE OF SQUARE TEST SECTION.** Ivan E. Beckwith, Herbert W. Ridyard and Nancy Cromer. June 1952. 30p. diagrs., 5 tabs. (NACA TN 2711)

**USE OF FENCES TO INCREASE UNIFORMITY OF BOUNDARY LAYER ON SIDE WALLS OF SUPERSONIC WIND TUNNELS.** Rudolph C. Haefeli. July 1952. 15p. diagrs., photos., tab. (NACA RM E52E19)

**SUPERSONIC FLOW WITH WHIRL AND VORTICITY IN AXISYMMETRIC CHANNELS.** Ralph J. Eschborn. August 1952. 41p. diagrs. (NACA TN 2768)

**COMBINED EFFECT OF DAMPING SCREENS AND STREAM CONVERGENCE ON TURBULENCE.** Maurice Tucker. January 1953. i, 62p. diagrs., tab. (NACA TN 2878)

**CALCULATION OF THE SHAPE OF A TWO-DIMENSIONAL SUPERSONIC NOZZLE IN CLOSED FORM.** (Sul Calcolo in Termini Finiti dell'Effusore di una Galleria Bidimensionale Supersonica). Dante Cunsolo. January 1953. 29p. diagrs. (NACA TM 1358. Trans. from Aerotecnica, v. 31, no. 4, August 15, 1951, p. 225-230).

**THE DESIGN OF VARIABLE MACH NUMBER ASYMMETRIC SUPERSONIC NOZZLES BY TWO PROCEDURES EMPLOYING INCLINED AND CURVED SONIC LINES.** Clarence A. Syvertson and Raymond C. Savin. March 1953. 35p. diagrs., tab. (NACA TN 2922)

**THE AERODYNAMIC DESIGN AND CALIBRATION OF AN ASYMMETRIC VARIABLE MACH NUMBER NOZZLE WITH A SLIDING BLOCK FOR THE MACH NUMBER RANGE 1.27 TO 2.75.** Paige B. Burbank and Robert W. Byrne. April 1953. 37p. photos., diagrs., 5 tabs. (NACA TN 2921. Formerly RM L50L15)

**ANALYSIS OF HEAT ADDITION IN A CONVERGENT-DIVERGENT NOZZLE.** Donald P. Hearth and Eugene Perchonok. April 1953. 18p. diagrs. (NACA TN 2938)

**PIPES**  
**(1.4.2.3)**

**MEASUREMENTS OF AVERAGE HEAT-TRANSFER AND FRICTION COEFFICIENTS FOR SUBSONIC FLOW OF AIR IN SMOOTH TUBES AT HIGH SURFACE AND FLUID TEMPERATURES.** Leroy V. Humble, Warren H. Lowdermilk and Leland G. Desmon. 1951. 15p. diagrs. (NACA Rept. 1020. Formerly RM E7L31; RM E8L03; RM E50E23; RM E50H23)

## AERODYNAMICS

### 60 INTERNAL (1.4)

#### Pipes (Cont.)

ANALYTICAL INVESTIGATION OF FULLY DEVELOPED LAMINAR FLOW IN TUBES WITH HEAT TRANSFER WITH FLUID PROPERTIES VARIABLE ALONG THE RADIUS. Robert G. Deissler. July 1951. 28p. diags. (NACA TN 2410)

BEHAVIOR OF FAST MOVING FLOW OF COMPRESSIBLE GAS IN CYLINDRICAL PIPE IN PRESENCE OF COOLING. (K Voprosu o Povedenii Bystrodvizhushchegosya Potoka Szhimayemogo Gaza v Pryamoii Tsilindricheskoi Trube pri Nalichii Okhlazhdeniya). G. A. Varshavsky. September 1951. 8p. diags. (NACA TM 1274. Trans. from Zhurnal Tekhnicheskoi Fiziki, v.16, no.4, 1946, p.413-416).

ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF FULLY DEVELOPED TURBULENT FLOW OF AIR IN A SMOOTH TUBE WITH HEAT TRANSFER WITH VARIABLE FLUID PROPERTIES. R. G. Deissler and C. S. Eian. February 1952. 43p. diags. (NACA TN 2629)

ANALYSIS OF FULLY DEVELOPED TURBULENT HEAT TRANSFER AT LOW PECLET NUMBERS IN SMOOTH TUBES WITH APPLICATION TO LIQUID METALS. Robert G. Deissler. August 1952. 20p. diags. (NACA RM E52F05)

ANALYSIS OF HEAT TRANSFER AND FLUID FRICTION FOR FULLY DEVELOPED TURBULENT FLOW OF SUPERCRITICAL WATER WITH VARIABLE FLUID PROPERTIES IN A SMOOTH TUBE. Robert G. Deissler and Maynard F. Taylor. April 1953. 29p. diags. (NACA RM E53B17)

#### BENDS (1.4.2.4)

GENERALIZATION OF BOUNDARY-LAYER MOMENTUM-INTEGRAL EQUATIONS TO THREE-DIMENSIONAL FLOWS INCLUDING THOSE OF ROTATING SYSTEM. Artur Mager. 1952. ii, 16p. diags. (NACA Rept. 1067. Formerly TN 2310).

EXPERIMENTAL INVESTIGATION OF A 90° CASCADE DIFFUSING BEND WITH AN AREA RATIO OF 1.45:1 AND WITH SEVERAL INLET BOUNDARY LAYERS. Daniel Friedman and Willard R. Westphal. April 1952. 30p. diags., photos., 2 tabs. (NACA TN 2668)

TWO-DIMENSIONAL SHEAR FLOW IN A 90° ELBOW. James J. Kramer and John D. Stanitz. July 1952. 44p. diags. (NACA TN 2736)

#### EXITS (1.4.3)

WIND-TUNNEL INVESTIGATION OF AIR INLET AND OUTLET OPENINGS ON A STREAMLINE BODY. John V. Becker. 1951. ii, 21p. diags., photos., 3 tabs. (NACA Rept. 1038. Formerly ACR, November 1940)

SPECTRA AND DIFFUSION IN A ROUND TURBULENT JET. Stanley Corrsin and Mahinder S. Uberoi. 1951. ii, 21p. diags., photos. (NACA Rept. 1040. Formerly TN 2124)

AN INVESTIGATION OF THE EFFECTS OF JET-OUTLET CUTOFF ANGLE ON THRUST DIRECTION AND BODY PITCHING MOMENT. James R. Blackaby. June 1951. 39p. diags., photos., tab. (NACA TN 2379)

EFFECTS OF PRESSURE-RAKE DESIGN PARAMETERS ON STATIC-PRESSURE MEASUREMENT FOR RAKES USED IN SUBSONIC FREE JETS. Lloyd N. Krause. October 1951. 20p. diags. (NACA TN 2520)

PERFORMANCE CHARACTERISTICS OF PLANE-WALL TWO-DIMENSIONAL DIFFUSERS. Elliott G. Reid, Stanford University. February 1953. i, 80p. diags., photos., 3 tabs. (NACA TN 2888)

#### JET PUMPS AND THRUST AUGMENTORS (1.4.4)

INVESTIGATION OF THRUST AUGMENTATION OF A 1600-POUND THRUST CENTRIFUGAL-FLOW-TYPE TURBOJET ENGINE BY INJECTION OF REFRIGERANTS AT COMPRESSOR INLETS. William L. Jones and Harry W. Dowman. August 25, 1947. 44p. diags., photo., tab. (NACA RM E7G23) (Declassified from Restricted, 6/5/53)

#### CASCADES (1.4.5)

ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF 90° SUPERSONIC TURNING PASSAGES SUITABLE FOR SUPERSONIC COMPRESSORS OR TURBINES. Luke L. Luccini. September 12, 1949. 91p. photos., diags., 3 tabs. (NACA RM L9G07) (Declassified from Confidential, 4/13/53)

EXPERIMENTAL INVESTIGATION OF THE MIXING LOSS BEHIND THE TRAILING EDGE OF A CASCADE OF THREE 90° SUPERSONIC TURNING PASSAGES. Luke L. Luccini. August 15, 1950. 31p. diags., photos., tab. (NACA RM L50F21a) (Declassified from Confidential, 4/13/53)

METHOD OF ANALYSIS FOR COMPRESSIBLE FLOW PAST ARBITRARY TURBOMACHINE BLADES ON GENERAL SURFACE OF REVOLUTION. Chung-Hua Wu and Curtis A. Brown. July 1951. 42p. diags. (NACA TN 2407)

A METHOD OF DESIGNING TURBOMACHINE BLADES WITH A DESIRABLE THICKNESS DISTRIBUTION FOR COMPRESSIBLE FLOW ALONG AN ARBITRARY STREAM FILAMENT OF REVOLUTION. Chung-Hua Wu and Curtis A. Brown. September 1951. 45p. diags., 6 tabs. (NACA TN 2455)

## Cascades (Cont.)

EFFECT OF MACH NUMBER ON THE FLOW AND APPLICATION OF COMPRESSIBILITY CORRECTIONS IN A TWO-DIMENSIONAL SUBSONIC-TRANSONIC COMPRESSOR CASCADE HAVING VARIED POROUS-WALL SUCTION AT THE BLADE TIPS. William B. Briggs. March 1952. 43p. diags., photos. (NACA TN 2649)

EFFECT OF GEOMETRY ON SECONDARY FLOWS IN BLADE ROWS. A. G. Hansen, G. R. Costello and H. Z. Herzig. October 1952. 38p. photos. (NACA RM E52H26)

SMOKE STUDIES OF SECONDARY FLOWS IN BENDS, TANDEM CASCADES, AND HIGH-TURNING CONFIGURATIONS. Arthur G. Hansen, Howard Z. Herzig and George R. Costello. March 1953. 33p. photos., diagr. (NACA RM E52L24a)

A VISUALIZATION STUDY OF SECONDARY FLOWS IN CASCADES. Arthur G. Hansen, Howard Z. Herzig and George R. Costello. May 1953. 93p. photos., diags. (NACA TN 2947. Formerly RM E52F19)

## THEORY (1.4.5.1)

APPROXIMATE RELATIVE-TOTAL-PRESSURE LOSSES OF AN INFINITE CASCADE OF SUPERSONIC BLADES WITH FINITE LEADING-EDGE THICKNESS. John F. Klapproth. March 3, 1950. 8p. diags. (NACA RM E9L21) (Declassified from Restricted, 4/13/53)

FLOW THROUGH CASCADES IN TANDEM. William E. Spraglin. June 1951. 44p. diags. (NACA TN 2393)

APPROXIMATE DESIGN METHOD FOR HIGH-SOLIDITY BLADE ELEMENTS IN COMPRESSORS AND TURBINES. John D. Stanitz. July 1951. 76p. diags., 2 tabs. (NACA TN 2408)

A METHOD OF SOLVING THE DIRECT AND INVERSE PROBLEM OF SUPERSONIC FLOW ALONG ARBITRARY STREAM FILAMENTS OF REVOLUTION IN TURBOMACHINES. Chung-Hua Wu and Eleanor L. Costilow. September 1951. 25p. diags. (NACA TN 2492)

RESISTANCE OF CASCADE OF AIRFOILS IN GAS STREAM AT SUBSONIC VELOCITY. (Soprotivlenie Reshetki Profilei v Gazovom Potoke s Dokriticheskimi Skorostiami). L. G. Loitsianskii. September 1951. 30p. diags. (NACA TM 1303. Trans. from Prikladnaya Matematika i Mekhanika, v.13, no.2, 1949).

GENERALIZATION OF JOUKOWSKI FORMULA TO AN AIRFOIL OF A CASCADE IN COMPRESSIBLE GAS STREAM WITH SUBSONIC VELOCITIES. (Obobshchenie Formuly Zhukovskogo na Sluchai Profilei v Reshetke Obtekaemoi Szhimaemym Gazom pri Dozvukovykh Skorostiakh). L. G. Loitsianskii. September 1951. 16p. diags. (NACA TM 1304. Trans. from Prikladnaya Matematika i Mekhanika, v.13, no.2, 1949, p.209-216).

ANALYSIS OF AN AXIAL COMPRESSOR STAGE WITH INFINITESIMAL AND FINITE BLADE SPACING. H. J. Reissner and L. Meyerhoff, Polytechnic Institute of Brooklyn. October 1951. 32p. diags. (NACA TN 2493)

EXPRESSIONS FOR MEASURING THE ACCURACY OF APPROXIMATE SOLUTIONS TO COMPRESSIBLE FLOW THROUGH CASCADES OF BLADES WITH EXAMPLES OF USE. John T. Sinnette, Jr., George R. Costello and Robert L. Cummings. October 1951. 33p. diags. (NACA TN 2501)

DETAILED COMPUTATIONAL PROCEDURE FOR DESIGN OF CASCADE BLADES WITH PRESCRIBED VELOCITY DISTRIBUTIONS IN COMPRESSIBLE POTENTIAL FLOWS. George R. Costello, Robert L. Cummings and John T. Sinnette, Jr. 1952. ii, 14p. diags., 9 tabs. (NACA Rept. 1060. Formerly TN 2281)

APPLICATION OF A CHANNEL DESIGN METHOD TO HIGH-SOLIDITY CASCADES AND TESTS OF AN IMPULSE CASCADE WITH 90° OF TURNING. John D. Stanitz and Leonard J. Sheldrake. March 1952. 65p. diags., photos., 2 tabs. (NACA TN 2652)

A COMPRESSIBLE-FLOW PLOTTING DEVICE AND ITS APPLICATION TO CASCADE FLOWS. Willard R. Westphal and James C. Dunavant. April 1952. 21p. diags., photos. (NACA TN 2681)

APPLICATION OF SUPERSONIC VORTEX-FLOW THEORY TO THE DESIGN OF SUPERSONIC IMPULSE COMPRESSOR- OR TURBINE-BLADE SECTIONS. Emanuel Boxer, James R. Sterrett and John Wlodarski. April 24, 1952. 70p. diags., photos., 4 tabs. (NACA RM L52B06) (Declassified from Confidential, 4/13/53)

TWO-DIMENSIONAL STEADY NONVISCOUS AND VISCOUS COMPRESSIBLE FLOW THROUGH A SYSTEM OF EQUIDISTANT BLADES. Hans J. Reissner, Leonard Meyerhoff and Martin Bloom, Polytechnic Institute of Brooklyn. June 1952. 48p. diags., 4 tabs. (NACA TN 2718)

## EXPERIMENT (1.4.5.2)

APPLICATION OF A CHANNEL DESIGN METHOD TO HIGH-SOLIDITY CASCADES AND TESTS OF AN IMPULSE CASCADE WITH 90° OF TURNING. John D. Stanitz and Leonard J. Sheldrake. March 1952. 65p. diags., photos., 2 tabs. (NACA TN 2652)

EXPERIMENTAL INVESTIGATION OF A 90° CASCADE DIFFUSING BEND WITH AN AREA RATIO OF 1.45:1 AND WITH SEVERAL INLET BOUNDARY LAYERS. Daniel Friedman and Willard R. Westphal. April 1952. 30p. diags., photos., 2 tabs. (NACA TN 2668)

A COMPRESSIBLE-FLOW PLOTTING DEVICE AND ITS APPLICATION TO CASCADE FLOWS. Willard R. Westphal and James C. Dunavant. April 1952. 21p. diags., photos. (NACA TN 2681)

APPLICATION OF SUPERSONIC VORTEX-FLOW THEORY TO THE DESIGN OF SUPERSONIC IMPULSE COMPRESSOR- OR TURBINE-BLADE SECTIONS. Emanuel Boxer, James R. Sterrett and John Wlodarski. April 24, 1952. 70p. diags., photos., 4 tabs. (NACA RM L52B06) (Declassified from Confidential, 4/13/53)

EXPERIMENTAL INVESTIGATION OF LOSS IN AN ANNULAR CASCADE OF TURBINE-NOZZLE BLADES OF FREE VORTEX DESIGN. Hubert W. Allen, Milton G. Kofskey and Richard E. Chamness. January 1953. 33p. diags., photos., tab. (NACA TN 2871)

## AERODYNAMICS 62 INTERNAL (1.4)

### Experiment - Cascades (Cont.)

STUDY OF SECONDARY-FLOW PATTERNS IN AN ANNULAR CASCADE OF TURBINE NOZZLE BLADES WITH VORTEX DESIGN. Harold E. Rohlik, Hubert W. Allen and Howard Z. Herzig. March 1953. 29p. diagrs., photos. (NACA TN 2909)

## BOUNDARY LAYER (1.4.7)

PRESENT STATUS OF RESEARCH ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

THE EFFECT OF THE INLET MACH NUMBER AND INLET-BOUNDARY-LAYER THICKNESS ON THE PERFORMANCE OF A 23° CONICAL-DIFFUSER - TAIL-PIPE COMBINATION. Jerome Persh. March 21, 1950. 53p. diagrs. (NACA RM L9K10) (Declassified from Restricted, 6/11/53)

HIGH-SUBSONIC PERFORMANCE CHARACTERISTICS AND BOUNDARY-LAYER INVESTIGATIONS OF A 12° 10-INCH-INLET-DIAMETER CONICAL DIFFUSER. B. H. Little, Jr. and Stafford W. Wilbur. May 11, 1950. 62p. diagrs., photos. (NACA RM L50C02a) (Declassified from Restricted, 6/11/53)

INVESTIGATION OF TURBULENT FLOW IN A TWO-DIMENSIONAL CHANNEL. John Laufer, California Institute of Technology. 1951. 20p. diagrs., photos. (NACA Rept. 1053. Formerly TN 2123)

THEORETICAL INVESTIGATION OF SUBMERGED INLETS AT LOW SPEEDS. Alvin H. Sacks and John R. Spreiter. August 1951. 48p. diagrs., photos. (NACA TN 2323)

ON THE RECORDING OF TURBULENT LONGITUDINAL AND TRANSVERSE FLUCTUATIONS. (Über das Messen turbulenter Längs- und Querschwankungen). H. Reichardt. August 1951. 10p. diagrs. (NACA TM 1313. Trans. from Zeitschrift für angewandte Mathematik und Mechanik, v. 18, no. 6, December 1938, p.358-361).

A PROCEDURE FOR CALCULATING THE DEVELOPMENT OF TURBULENT BOUNDARY LAYERS UNDER THE INFLUENCE OF ADVERSE PRESSURE GRADIENTS. Kennedy F. Rubert and Jerome Persh. September 1951. 61p. diagrs. (NACA TN 2478)

GENERALIZATION OF BOUNDARY-LAYER MOMENTUM-INTEGRAL EQUATIONS TO THREE-DIMENSIONAL FLOWS INCLUDING THOSE OF ROTATING SYSTEM. Artur Mager. 1952. ii, 16p. diagrs. (NACA Rept. 1067. Formerly TN 2310).

ON REFLECTION OF SHOCK WAVES FROM BOUNDARY LAYERS. H. W. Liepmann, A. Roshko and S. Dhawan, California Institute of Technology. 1952. ii, 29p. diagrs., photos., tab. (NACA Rept. 1100. Formerly TN 2334)

AUXILIARY EQUIPMENT AND TECHNIQUES FOR ADAPTING THE CONSTANT-TEMPERATURE HOT-WIRE ANEMOMETER TO SPECIFIC PROBLEMS IN AIR-FLOW MEASUREMENTS. James C. Laurence and L. Gene Landes. December 1952. ii, 77p. diagrs., photos., 3 tabs. (NACA TN 2843)

ON THE THEORY OF THE TURBULENT BOUNDARY LAYER. (Über die Theorie der turbulenten Grenzschichten). J. Rotta. February 1953. 50p. diagrs. (NACA TM 1344. Trans. from Max-Planck-Institut für Strömungsforschung, Göttingen. Mitteilungen 1, 1950)

## CHARACTERISTICS (1.4.7.1)

INVESTIGATION OF HIGH-SUBSONIC PERFORMANCE CHARACTERISTICS OF A 12° 21-INCH CONICAL DIFFUSER, INCLUDING THE EFFECTS OF CHANGE IN INLET-BOUNDARY-LAYER THICKNESS. Martin R. Copp and Paul L. Klevatt. March 24, 1950. 51p. diagrs., photos. (NACA RM L9H10) (Declassified from Restricted, 6/11/53)

DISCUSSION OF BOUNDARY-LAYER CHARACTERISTICS NEAR THE WALL OF AN AXIAL-FLOW COMPRESSOR. Artur Mager, John J. Mahoney and Ray E. Budinger. 1952. ii, 20p. diagrs., photo., tab. (NACA Rept. 1085. Formerly RM E51H07)

ON REFLECTION OF SHOCK WAVES FROM BOUNDARY LAYERS. H. W. Liepmann, A. Roshko and S. Dhawan, California Institute of Technology. 1952. ii, 29p. diagrs., photos., tab. (NACA Rept. 1100. Formerly TN 2334)

LAMINAR BOUNDARY LAYER OVER FLAT PLATE IN A FLOW HAVING CIRCULAR STREAMLINES. Artur Mager and Arthur G. Hansen. March 1952. 28p. diagrs., tab. (NACA TN 2658)

EXPERIMENTAL INVESTIGATION OF A 90° CASCADE DIFFUSING BEND WITH AN AREA RATIO OF 1.45:1 AND WITH SEVERAL INLET BOUNDARY LAYERS. Daniel Friedman and Willard R. Westphal. April 1952. 30p. diagrs., photos., 2 tabs. (NACA TN 2668)

EFFECT OF GEOMETRY ON SECONDARY FLOWS IN BLADE ROWS. A. G. Hansen, G. R. Costello and H. Z. Herzig. October 1952. 38p. photos. (NACA RM E52H26)

INTERACTION BETWEEN A SUPERSONIC STREAM AND A PARALLEL SUBSONIC STREAM BOUNDED BY FLUID AT REST. Herbert S. Ribner and E. Leonard Arnoff. December 1952. 45p. diagrs., 2 tabs. (NACA TN 2860)

EXPERIMENTAL INVESTIGATION OF LOSS IN AN ANNULAR CASCADE OF TURBINE-NOZZLE BLADES OF FREE VORTEX DESIGN. Hubert W. Allen, Milton G. Kofskey and Richard E. Chamness. January 1953. 33p. diagrs., photos., tab. (NACA TN 2871)

STUDY OF SECONDARY-FLOW PATTERNS IN AN ANNULAR CASCADE OF TURBINE NOZZLE BLADES WITH VORTEX DESIGN. Harold E. Rohlik, Hubert W. Allen and Howard Z. Herzig. March 1953. 29p. diagrs., photos. (NACA TN 2909)

Characteristics - Boundary Layer  
(Cont.)

SMOKE STUDIES OF SECONDARY FLOWS IN BENDS, TANDEM CASCADES, AND HIGH-TURNING CONFIGURATIONS. Arthur G. Hansen, Howard Z. Herzig and George R. Costello. March 1953. 33p. photos., diagr. (NACA RM E52L24a)

A VISUALIZATION STUDY OF SECONDARY FLOWS IN CASCADES. Arthur G. Hansen, Howard Z. Herzig and George R. Costello. May 1953. 93p. photos., diagrs. (NACA TN 2947. Formerly RM E52F19)

CONTROL  
(1.4.7.2)

EFFECT OF MACH NUMBER ON THE FLOW AND APPLICATION OF COMPRESSIBILITY CORRECTIONS IN A TWO-DIMENSIONAL SUBSONIC-TRANSONIC COMPRESSOR CASCADE HAVING VARIED POROUS-WALL SUCTION AT THE BLADE TIPS. William B. Briggs. March 1952. 43p. diagrs., photos. (NACA TN 2649)

APPLICATION OF SUPERSONIC VORTEX-FLOW THEORY TO THE DESIGN OF SUPERSONIC IMPULSE COMPRESSOR- OR TURBINE-BLADE SECTIONS. Emanuel Boxer, James R. Sterrett and John Wlodarski. April 24, 1952. 70p. diagrs., photos., 4 tabs. (NACA RM L52B06) (Declassified from Confidential, 4/13/53)

USE OF FENCES TO INCREASE UNIFORMITY OF BOUNDARY LAYER ON SIDE WALLS OF SUPERSONIC WIND TUNNELS. Rudolph C. Haefeli. July 1952. 15p. diagrs., photos., tab. (NACA RM E52E19)

USE OF A CONSOLIDATED POROUS MEDIUM FOR MEASUREMENT OF FLOW RATE AND VISCOSITY OF GASES AT ELEVATED PRESSURES AND TEMPERATURES. Martin B. Biles and J. A. Putnam, University of California. September 1952. 51p. diagrs., photos., 7 tabs. (NACA TN 2783)



## Propellers

### (1.5)

**METHOD FOR STRESS ANALYSIS OF A SWEEPED PROPELLER.** Richard T. Whitcomb. September 27, 1948. 29p. diagrs. (NACA RM L8F11) (Declassified from Confidential, 8/15/51)

**AERODYNAMIC CHARACTERISTICS OF A THREE-BLADE PROPELLER HAVING NACA 10-(3)(08)-03 BLADES.** Robert E. Davidson. October 29, 1948. 29p. diagrs., tab. (NACA RM L8H16) (Declassified from Confidential, 11/26/52)

**A STUDY OF THE USE OF EXPERIMENTAL STABILITY DERIVATIVES IN THE CALCULATION OF THE LATERAL DISTURBED MOTIONS OF A SWEEPED WING AIRPLANE AND COMPARISON WITH FLIGHT RESULTS.** John D. Bird and Byron M. Jaquet. 1951. ii, 25p. diagrs., photos., 4 tabs. (NACA Rept. 1031. Formerly TN 2013)

**A SURVEY OF THE AIRCRAFT-NOISE PROBLEM WITH SPECIAL REFERENCE TO ITS PHYSICAL ASPECTS.** Harvey H. Hubbard. May 1952. 41p. diagrs., photos. (NACA TN 2701)

### THEORY

#### (1.5.1)

**RESPONSE OF A ROTATING PROPELLER TO AERODYNAMIC EXCITATION.** Walter E. Arnoldi, Hamilton Standard Propellers Division, United Aircraft Corporation. January 21, 1949. 26p. diagrs. (NACA RM 8107) (Declassified from Restricted, 9/16/52)

**AXIAL-MOMENTUM THEORY FOR PROPELLERS IN COMPRESSIBLE FLOW.** (Corrected copy) Arthur W. Vogeley. July 1951. 12p. diagrs. (NACA TN 2164) (Supersedes TN 2164, August 1950)

**GENERALIZATION OF BOUNDARY-LAYER MOMENTUM-INTEGRAL EQUATIONS TO THREE-DIMENSIONAL FLOWS INCLUDING THOSE OF ROTATING SYSTEM.** Artur Mager. 1952. ii, 16p. diagrs. (NACA Rept. 1067. Formerly TN 2310).

**SOUND FROM A TWO-BLADE PROPELLER AT SUPERSONIC TIP SPEEDS.** Harvey H. Hubbard and Leslie W. Lassiter. 1952. ii, 9p. diagrs., photos. (NACA Rept. 1079. Formerly RM L51C27)

**AN EXTENSION OF LIFTING ROTOR THEORY TO COVER OPERATION AT LARGE ANGLES OF ATTACK AND HIGH INFLOW CONDITIONS.** Alfred Gessow and Almer D. Crim. April 1952. 36p. diagrs. (NACA TN 2665)

**THE AERODYNAMIC DESIGN OF SUPERSONIC PROPELLERS FROM STRUCTURAL CONSIDERATION.** Jerome B. Hammack. December 1952. 21p. diagrs. (NACA TN 2851)

**THE LANGLEY 2,000-HORSEPOWER PROPELLER DYNAMOMETER AND TESTS AT HIGH SPEED OF AN NACA 10-(3)(08)-03 TWO-BLADE PROPELLER.** Blake W. Corson, Jr. and Julian D. Maynard. December 1952. 75p. diagrs., photos., 3 tabs. (NACA TN 2859. Formerly RM L7L29)

**STUDY OF THE SUPERSONIC PROPELLER.** (Étude de L'Hélice Supersonique). Jean Fabri and Raymond Siestrunk. March 1953. 23p. diagrs. (NACA TM 1355. Trans. from Ministère de l'Air. Publications Scientifiques et Techniques 248, 1951, p. 113-130; International Conference on Mechanics, Proceedings, v. 1, 1950).

### DESIGN VARIABLES

#### (1.5.2)

**EFFECT OF SHANK DESIGN ON PROPELLER PERFORMANCE AT HIGH SPEEDS.** James B. Delano and Melvin M. Carmel. June 1946. 87p. diagrs., photos., tab. (NACA ARR L6D23) (Declassified from Restricted, 2/28/52)

**AERODYNAMIC CHARACTERISTICS AT HIGH SPEEDS OF FULL-SCALE PROPELLERS HAVING DIFFERENT SHANK DESIGNS.** Julian D. Maynard. February 13, 1947. 72p. diagrs., photos., tab. (NACA RM L6L27a) (Declassified from Restricted, 2/28/52)

**AERODYNAMIC CHARACTERISTICS OF A TWO-BLADE NACA 10-(3)(12)-03 PROPELLER.** W. H. Gray and A. E. Allis. August 30, 1948. 27p. diagrs., tab. (NACA RM L8D01) (Declassified from Restricted, 12/28/51)

**AERODYNAMIC CHARACTERISTICS OF A THREE-BLADE PROPELLER HAVING NACA 10-(3)(08)-03 BLADES.** Robert E. Davidson. October 29, 1948. 29p. diagrs., tab. (NACA RM L8H16) (Declassified from Confidential, 11/26/52)

**THE EFFECTS OF REYNOLDS NUMBER ON THE APPLICATION OF NACA 16-SERIES AIRFOIL CHARACTERISTICS TO PROPELLER DESIGN.** Harold E. Cleary. January 1952. 15p. diagrs. (NACA TN 2591. Formerly RM L7H12)

**THE AERODYNAMIC DESIGN OF SUPERSONIC PROPELLERS FROM STRUCTURAL CONSIDERATION.** Jerome B. Hammack. December 1952. 21p. diagrs. (NACA TN 2851)

*Design Variables (Cont.)*

STUDY OF THE SUPERSONIC PROPELLER. (Étude de L'Hélice Supersonique). Jean Fabri and Raymond Siestrunk. March 1953. 23p. diagrs. (NACA TM 1355. Trans. from Ministère de l'Air. Publications Scientifiques et Techniques 248, 1951, p. 113-130; International Conference on Mechanics, Proceedings, v. 1, 1950).

**BLADE SECTIONS  
(1.5.2.1)**

PRELIMINARY INVESTIGATION TO DETERMINE PROPELLER SECTION CHARACTERISTICS BY MEASURING THE PRESSURE DISTRIBUTION ON AN NACA 10-(3)(08)-03 PROPELLER UNDER OPERATING CONDITIONS. Albert J. Evans and George Liner. July 14, 1948. 52p. diagrs., tab. (NACA RM L8E11) (Declassified from Confidential, 9/16/52)

AERODYNAMIC CHARACTERISTICS AT HIGH SPEEDS OF RELATED FULL-SCALE PROPELLERS HAVING DIFFERENT BLADE-SECTION CAMBERS. Julian D. Maynard and Leland B. Salters, Jr. August 31, 1948. 54p. diagrs., tab., photo. (NACA RM L8E06) (Declassified from Restricted, 11/26/52)

AERODYNAMIC CHARACTERISTICS AT HIGH SPEEDS OF FULL-SCALE PROPELLERS HAVING CLARK Y BLADE SECTIONS. Peter J. Johnson. October 26, 1948. 60p. diagrs., photos., tab. (NACA RM L8E07) (Declassified from Restricted, 11/26/52)

THE EFFECT OF BLADE-SECTION THICKNESS RATIOS ON THE AERODYNAMIC CHARACTERISTICS OF RELATED FULL-SCALE PROPELLERS AT MACH NUMBERS UP TO 0.65. Julian D. Maynard and Seymour Steinberg. June 6, 1949. 90p. diagrs., photos., tab. (NACA RM L9D29) (Declassified from Confidential, 3/28/52)

INVESTIGATION OF THE NACA 4-(5)(08)-03 AND NACA 4-(10)(08)-03 TWO-BLADE PROPELLERS AT FORWARD MACH NUMBERS TO 0.725 TO DETERMINE THE EFFECTS OF CAMBER AND COMPRESSIBILITY ON PERFORMANCE. James B. Delano. 1951. 31p. photos., diagrs. (NACA Rept. 1012. Formerly ACR L5F15)

AXIAL-MOMENTUM THEORY FOR PROPELLERS IN COMPRESSIBLE FLOW. (Corrected copy) Arthur W. Vogeley. July 1951. 12p. diagrs. (NACA TN 2164) (Supersedes TN 2164, August 1950)

AERODYNAMIC CHARACTERISTICS OF A TWO-BLADE NACA 10-(3)(062)-045 PROPELLER AND OF A TWO-BLADE NACA 10-(3)(08)-045 PROPELLER. William Solomon. January 1953. 53p. diagrs., photo., tab. (NACA TN 2881. Formerly RM L8E26)

**SOLIDITY  
(1.5.2.2)**

THE EFFECT OF BLADE-SECTION THICKNESS RATIOS ON THE AERODYNAMIC CHARACTERISTICS OF RELATED FULL-SCALE PROPELLERS AT MACH NUMBERS UP TO 0.65. Julian D. Maynard and Seymour Steinberg. June 6, 1949. 90p. diagrs., photos., tab. (NACA RM L9D29) (Declassified from Confidential, 3/28/52)

**PITCH DISTRIBUTION  
(1.5.2.3)**

THE EFFECT OF BLADE-SECTION THICKNESS RATIOS ON THE AERODYNAMIC CHARACTERISTICS OF RELATED FULL-SCALE PROPELLERS AT MACH NUMBERS UP TO 0.65. Julian D. Maynard and Seymour Steinberg. June 6, 1949. 90p. diagrs., photos., tab. (NACA RM L9D29) (Declassified from Confidential, 3/28/52)

**BLADE PLAN FORMS  
(1.5.2.4)**

AERODYNAMIC CHARACTERISTICS OF A TWO-BLADE NACA 10-(3)(08)-03R PROPELLER. Albert J. Evans and Leland B. Salters, Jr. September 2, 1948. 29p. diagrs., tab. (NACA RM L8E24) (Declassified from Restricted, 11/26/52)

AERODYNAMIC CHARACTERISTICS AT HIGH SPEEDS OF FULL-SCALE PROPELLERS HAVING CLARK Y BLADE SECTIONS. Peter J. Johnson. October 26, 1948. 60p. diagrs., photos., tab. (NACA RM L8E07) (Declassified from Restricted, 11/26/52)

**MACH NUMBER EFFECTS  
(1.5.2.5)**

EFFECT OF SHANK DESIGN ON PROPELLER PERFORMANCE AT HIGH SPEEDS. James B. Delano and Melvin M. Carmel. June 1946. 87p. diagrs., photos., tab. (NACA ARR L6D23) (Declassified from Restricted, 2/28/52)

AERODYNAMIC CHARACTERISTICS AT HIGH SPEEDS OF FULL-SCALE PROPELLERS HAVING DIFFERENT SHANK DESIGNS. Julian D. Maynard. February 13, 1947. 72p. diagrs., photos., tab. (NACA RM L6L27a) (Declassified from Restricted, 2/28/52)

PRELIMINARY INVESTIGATION TO DETERMINE PROPELLER SECTION CHARACTERISTICS BY MEASURING THE PRESSURE DISTRIBUTION ON AN NACA 10-(3)(08)-03 PROPELLER UNDER OPERATING CONDITIONS. Albert J. Evans and George Liner. July 14, 1948. 52p. diagrs., tab. (NACA RM L8E11) (Declassified from Confidential, 9/16/52)

AERODYNAMIC CHARACTERISTICS AT HIGH SPEEDS OF RELATED FULL-SCALE PROPELLERS HAVING DIFFERENT BLADE-SECTION CAMBERS. Julian D. Maynard and Leland B. Salters, Jr. August 31, 1948. 54p. diagrs., tab., photo. (NACA RM L8E06) (Declassified from Restricted, 11/26/52)

AERODYNAMIC CHARACTERISTICS AT HIGH SPEEDS OF FULL-SCALE PROPELLERS HAVING CLARK Y BLADE SECTIONS. Peter J. Johnson. October 26, 1948. 60p. diagrs., photos., tab. (NACA RM L8E07) (Declassified from Restricted, 11/26/52)

## AERODYNAMICS 66 PROPELLERS (1.5)

### *Mach Number Effects - Design Variables (Cont.)*

THE EFFECT OF BLADE-SECTION THICKNESS RATIOS ON THE AERODYNAMIC CHARACTERISTICS OF RELATED FULL-SCALE PROPELLERS AT MACH NUMBERS UP TO 0.85. Julian D. Maynard and Seymour Steinberg. June 6, 1949. 90p. diags., photos., tab. (NACA RM L9D29) (Declassified from Confidential, 3/28/52)

INVESTIGATION OF THE NACA 4-(5)(08)-03 AND NACA 4-(10)(08)-03 TWO-BLADE PROPELLERS AT FORWARD MACH NUMBERS TO 0.725 TO DETERMINE THE EFFECTS OF CAMBER AND COMPRESSIBILITY ON PERFORMANCE. James B. Delano. 1951. 31p. photos., diags. (NACA Rept. 1012. Formerly ACR L5F15)

AXIAL-MOMENTUM THEORY FOR PROPELLERS IN COMPRESSIBLE FLOW. (Corrected copy) Arthur W. Vogeley. July 1951. 12p. diags. (NACA TN 2164) (Supersedes TN 2164, August 1950)

SOUND FROM A TWO-BLADE PROPELLER AT SUPERSONIC TIP SPEEDS. Harvey H. Hubbard and Leslie W. Lassiter. 1952. ii, 9p. diags., photos. (NACA Rept. 1079. Formerly RM L51C27)

THE LANGLEY 2,000-HORSEPOWER PROPELLER DYNAMOMETER AND TESTS AT HIGH SPEED OF AN NACA 10-(3)(08)-03 TWO-BLADE PROPELLER. Blake W. Corson, Jr. and Julian D. Maynard. December 1952. 75p. diags., photos., 3 tabs. (NACA TN 2859. Formerly RM L7L29)

AERODYNAMIC CHARACTERISTICS OF A TWO-BLADE NACA 10-(3)(062)-045 PROPELLER AND OF A TWO-BLADE NACA 10-(3)(08)-045 PROPELLER. William Solomon. January 1953. 53p. diags., photo., tab. (NACA TN 2881. Formerly RM L8E26)

STUDY OF THE SUPERSONIC PROPELLER. (Etude de L'Hélice Supersonique). Jean Fabri and Raymond Siestrunk. March 1953. 23p. diags. (NACA TM 1355. Trans. from Ministère de l'Air. Publications Scientifiques et Techniques 248, 1951, p. 113-130; International Conference on Mechanics, Proceedings, v. 1, 1950).

### PUSHER (1.5.2.6)

EXPERIMENTS IN EXTERNAL NOISE REDUCTION OF A SMALL PUSHER-TYPE AMPHIBIAN AIR-PLANE. John P. Roberts and Leo L. Beranek. Aeronautical Research Foundation. July 1952. 142p. diags., photos., 3 tabs. (NACA TN 2727)

### INTERFERENCE OF BODIES (1.5.2.8)

AXIAL-MOMENTUM THEORY FOR PROPELLERS IN COMPRESSIBLE FLOW. (Corrected copy) Arthur W. Vogeley. July 1951. 12p. diags. (NACA TN 2164) (Supersedes TN 2164, August 1950)

A METHOD FOR PREDICTING THE UPWASH ANGLES INDUCED AT THE PROPELLER PLANE OF A COMBINATION OF BODIES WITH AN UNSWEPT WING. Paul F. Yaggy. October 1951. 24p. diags., photos. (NACA TN 2528)

EFFECTS OF WING SWEEP ON THE UPWASH AT THE PROPELLER PLANES OF MULTIENGINE AIR-PLANES. Vernon L. Rogallo. September 1952. 46p. diags. (NACA TN 2795)

CALCULATIONS OF UPWASH IN THE REGION ABOVE OR BELOW THE WING-CHORD PLANES OF SWEEPED-BACK WING-FUSELAGE-NACELLE COMBINATIONS. Vernon L. Rogallo and John L. McCloud, III. February 1953. 15p. diags., photo. (NACA TN 2894)

### PITCH AND YAW (1.5.2.9)

CALCULATION OF AERODYNAMIC FORCES ON A PROPELLER IN PITCH OR YAW. John L. Crigler and Jean Gilman, Jr. January 1952. 33p. diags. (NACA TN 2585. Formerly RM L8K26)

AN EXTENSION OF LIFTING ROTOR THEORY TO COVER OPERATION AT LARGE ANGLES OF ATTACK AND HIGH INFLOW CONDITIONS. Alfred Gessow and Almer D. Crim. April 1952. 36p. diags. (NACA TN 2665)

### DIAMETER (1.5.2.10)

COMPARISON OF TESTS OF A 4-FOOT-DIAMETER PROPELLER IN THE LANGLEY 8-FOOT AND 16-FOOT HIGH-SPEED TUNNELS. Morton Cooper. March 1946. 24p. diags., photo. (NACA ACR L5H31) (Declassified from Restricted, 2/28/52)

## DESIGNATED TYPES (1.5.3)

COMPARISON OF TESTS OF A 4-FOOT-DIAMETER PROPELLER IN THE LANGLEY 8-FOOT AND 16-FOOT HIGH-SPEED TUNNELS. Morton Cooper. March 1946. 24p. diags., photo. (NACA ACR L5H31) (Declassified from Restricted, 2/28/52)

AERODYNAMIC CHARACTERISTICS AT HIGH SPEEDS OF FULL-SCALE PROPELLERS HAVING DIFFERENT SHANK DESIGNS. Julian D. Maynard. February 13, 1947. 72p. diags., photos., tab. (NACA RM L6L27a) (Declassified from Restricted, 2/28/52)

AERODYNAMIC CHARACTERISTICS OF A TWO-BLADE NACA 10-(3)(12)-03 PROPELLER. W. H. Gray and A. E. Allis. August 30, 1948. 27p. diags., tab. (NACA RM L8D01) (Declassified from Restricted, 12/28/51)

AERODYNAMIC CHARACTERISTICS OF A TWO-BLADE NACA 10-(3)(08)-03R PROPELLER. Albert J. Evans and Leland B. Salters, Jr. September 2, 1948. 29p. diags., tab. (NACA RM L8E24) (Declassified from Restricted, 11/26/52)

*Designated Types (Cont.)*

INVESTIGATION OF THE NACA 4-(5)(08)-03 AND NACA 4-(10)(08)-03 TWO-BLADE PROPELLERS AT FORWARD MACH NUMBERS TO 0.725 TO DETERMINE THE EFFECTS OF CAMBER AND COMPRESSIBILITY ON PERFORMANCE. James B. Delano. 1951. 31p. photos., diagrs. (NACA Rept. 1012. Formerly ACR L5F15)

## SLIPSTREAM (1.5.4)

AXIAL-MOMENTUM THEORY FOR PROPELLERS IN COMPRESSIBLE FLOW. (Corrected copy) Arthur W. Vogeley. July 1951. 12p. diagrs. (NACA TN 2164) (Supersedes TN 2164, August 1950)

NACA TN 2776  
National Advisory Committee for Aeronautics.  
THE EFFECT OF A SIMULATED PROPELLER SLIPSTREAM ON THE AERODYNAMIC CHARACTERISTICS OF AN UNSWEPT WING PANEL WITH AND WITHOUT NACELLES AT MACH NUMBERS FROM 0.30 TO 0.86. Gareth H. Jordan and Richard I. Cole. September 1952. 15p. diagrs., photo. (NACA TN 2776)

LANGLEY FULL-SCALE-TUNNEL TESTS OF THE CUSTER CHANNEL WING AIRPLANE. Jerome Pasamanick. April 1953. 57p. diagrs., photos., tab. (NACA RM L53A09)

## OPERATING CONDITIONS (1.5.6)

AERODYNAMIC CHARACTERISTICS AT HIGH SPEEDS OF RELATED FULL-SCALE PROPELLERS HAVING DIFFERENT BLADE-SECTION CAMBERS. Julian D. Maynard and Leland B. Salters, Jr. August 31, 1948. 54p. diagrs., tab., photo. (NACA RM L8E06) (Declassified from Restricted, 11/26/52)

AERODYNAMIC CHARACTERISTICS AT HIGH SPEEDS OF FULL-SCALE PROPELLERS HAVING CLARK Y BLADE SECTIONS. Peter J. Johnson. October 26, 1948. 60p. diagrs., photos., tab. (NACA RM L8E07) (Declassified from Restricted, 11/26/52)

THE EFFECT OF BLADE-SECTION THICKNESS RATIOS ON THE AERODYNAMIC CHARACTERISTICS OF RELATED FULL-SCALE PROPELLERS AT MACH NUMBERS UP TO 0.65. Julian D. Maynard and Seymour Steinberg. June 6, 1949. 90p. diagrs., photos., tab. (NACA RM L9D29) (Declassified from Confidential, 3/28/52)

A METHOD FOR PREDICTING THE UPWASH ANGLES INDUCED AT THE PROPELLER PLANE OF A COMBINATION OF BODIES WITH AN UNSWEPT WING. Paul F. Yaggy. October 1951. 24p. diagrs., photos. (NACA TN 2528)

EFFECTS OF WING SWEEP ON THE UPWASH AT THE PROPELLER PLANES OF MULTIENGINE AIRPLANES. Vernon L. Rogallo. September 1952. 46p. diagrs. (NACA TN 2795)

AN INVESTIGATION UTILIZING AN ELECTRICAL ANALOGUE OF CYCLIC DE-ICING OF A HOLLOW STEEL PROPELLER WITH AN EXTERNAL BLADE SHOE. Carr B. Neel, Jr. December 1952. 54p. diagrs., photos., 3 tabs. (NACA TN 2852)

CALCULATIONS OF UPWASH IN THE REGION ABOVE OR BELOW THE WING-CHORD PLANES OF SWEEP-BACK WING-FUSELAGE-NACELLE COMBINATIONS. Vernon L. Rogallo and John L. McCloud, III. February 1953. 15p. diagrs., photo. (NACA TN 2894)

## Rotating Wings

### (1.6)

ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF 90° SUPERSONIC TURNING PASSAGES SUITABLE FOR SUPERSONIC COMPRESSORS OR TURBINES. Luke L. Liccini. September 12, 1949. 91p. photos., diagrs., 3 tabs. (NACA RM L9G07) (Declassified from Confidential, 4/13/53)

EXPERIMENTAL INVESTIGATION OF THE MIXING LOSS BEHIND THE TRAILING EDGE OF A CASCADE OF THREE 90° SUPERSONIC TURNING PASSAGES. Luke L. Liccini. August 15, 1950. 31p. diagrs., photos., tab. (NACA RM L50F21a) (Declassified from Confidential, 4/13/53)

### THEORY

#### (1.6.1)

PRELIMINARY ANALYSIS OF AXIAL-FLOW COMPRESSORS HAVING SUPERSONIC VELOCITY AT THE ENTRANCE OF THE STATOR. Antonio Ferri. September 12, 1949. 36p. diagrs. (NACA RM L9G06) (Declassified from Confidential, 4/13/53)

GENERALIZATION OF BOUNDARY-LAYER MOMENTUM-INTEGRAL EQUATIONS TO THREEDIMENSIONAL FLOWS INCLUDING THOSE OF ROTATING SYSTEM. Artur Mager. 1952. ii, 16p. diagrs. (NACA Rept. 1067. Formerly TN 2310).

AN INVESTIGATION OF BENDING-MOMENT DISTRIBUTION ON A MODEL HELICOPTER ROTOR BLADE AND A COMPARISON WITH THEORY. John R. Meyer, Jr., Massachusetts Institute of Technology. February 1952. 91p. diagrs., photos, 12 tabs. (NACA TN 2626)

BIBLIOGRAPHY OF NACA PAPERS ON ROTATING-WING AIRCRAFT, JANUARY 1952. Alfred Gessow. March 1952. 13p. (NACA RM L52B18a. Formerly RM L7J30)

AN EXTENSION OF LIFTING ROTOR THEORY TO COVER OPERATION AT LARGE ANGLES OF ATTACK AND HIGH INFLOW CONDITIONS. Alfred Gessow and Almer D. Crim. April 1952. 36p. diagrs. (NACA TN 2665)

A BLADE-ELEMENT ANALYSIS FOR LIFTING ROTORS THAT IS APPLICABLE FOR LARGE INFLOW AND BLADE ANGLES AND ANY REASONABLE BLADE GEOMETRY. Walter Castles, Jr. and Noah C. New, Georgia Institute of Technology. July 1952. 63p. diagrs., 7 tabs. (NACA TN 2656)

THE NORMAL COMPONENT OF THE INDUCED VELOCITY IN THE VICINITY OF A LIFTING ROTOR AND SOME EXAMPLES OF ITS APPLICATION. Walter Castles, Jr. and Jacob Henri De Leeuw, Georgia Institute of Technology. March 1953. 38p. diagrs., 3 tabs. (NACA TN 2912)

AN INVESTIGATION OF THE EXPERIMENTAL AERODYNAMIC LOADING ON A MODEL HELICOPTER ROTOR BLADE. John R. Meyer, Jr. and Gaetano Falabella, Jr., Massachusetts Institute of Technology. May 1953. 110p. diagrs., photos. (NACA TN 2953)

### EXPERIMENTAL STUDIES

#### (1.6.2)

AN INVESTIGATION OF BENDING-MOMENT DISTRIBUTION ON A MODEL HELICOPTER ROTOR BLADE AND A COMPARISON WITH THEORY. John R. Meyer, Jr., Massachusetts Institute of Technology. February 1952. 91p. diagrs., photos, 12 tabs. (NACA TN 2626)

NORMAL ACCELERATIONS AND OPERATING CONDITIONS ENCOUNTERED BY A HELICOPTER IN AIR-MAIL OPERATIONS. Almer D. Crim and Marlin E. Hazen. June 1952. 17p. diagrs., photos., 2 tabs. (NACA TN 2714)

INITIAL RESULTS OF INSTRUMENT-FLYING TRIALS CONDUCTED IN A SINGLE-ROTOR HELICOPTER. Almer D. Crim, John P. Reeder and James B. Whitten. June 1952. 16p. diagrs., photos. (NACA TN 2721)

AN INVESTIGATION OF THE EXPERIMENTAL AERODYNAMIC LOADING ON A MODEL HELICOPTER ROTOR BLADE. John R. Meyer, Jr. and Gaetano Falabella, Jr., Massachusetts Institute of Technology. May 1953. 110p. diagrs., photos. (NACA TN 2953)

### POWER-DRIVEN

#### (1.6.2.1)

EMPIRICAL RELATION BETWEEN INDUCED VELOCITY, THRUST, AND RATE OF DESCENT OF A HELICOPTER ROTOR AS DETERMINED BY WIND-TUNNEL TESTS ON FOUR MODEL ROTORS. Walter Castles, Jr. and Robin B. Gray, Georgia Institute of Technology. October 1951. 72p. diagrs., photos., 8 tabs. (NACA TN 2474)

*Power Driven - Experimental  
Studies (Cont.)*

EFFECTS OF COMPRESSIBILITY ON THE PERFORMANCE OF TWO FULL-SCALE HELICOPTER ROTORS. Paul J. Carpenter. 1952. ii, 8p. diags., photo. (NACA Rept. 1078. Formerly TN 2277)

SOME EFFECTS OF VARYING THE DAMPING IN PITCH AND ROLL ON THE FLYING QUALITIES OF A SMALL SINGLE-ROTOR HELICOPTER. John P. Reeder and James B. Whitten. January 1952. 23p. diags., photos., 4 tabs. (NACA TN 2459)

BIBLIOGRAPHY OF NACA PAPERS ON ROTATING-WING AIRCRAFT, JANUARY 1952. Alfred Gessow. March 1952. 13p. (NACA RM L52B18a. Formerly RM L7J30)

AUTOROTATING  
(1.6.2.2)

EMPIRICAL RELATION BETWEEN INDUCED VELOCITY, THRUST, AND RATE OF DESCENT OF A HELICOPTER ROTOR AS DETERMINED BY WIND-TUNNEL TESTS ON FOUR MODEL ROTORS. Walter Castles, Jr. and Robin B. Gray, Georgia Institute of Technology. October 1951. 72p. diags., photos., 8 tabs. (NACA TN 2474)

EXPERIMENTAL INVESTIGATION OF TRANSITION OF A MODEL HELICOPTER ROTOR FROM HOVERING TO VERTICAL AUTOROTATION. S. E. Slaymaker, Robert R. Lynn and Robin B. Gray, Princeton University. March 1952. 29p. diags., photos. (NACA TN 2648)

BIBLIOGRAPHY OF NACA PAPERS ON ROTATING-WING AIRCRAFT, JANUARY 1952. Alfred Gessow. March 1952. 13p. (NACA RM L52B18a. Formerly RM L7J30)

POWER-OFF FLARE-UP TESTS OF A MODEL HELICOPTER ROTOR IN VERTICAL AUTOROTATION. S. E. Slaymaker and Robin B. Gray, Princeton University. January 1953. 36p. diags., photos. (NACA TN 2870)

## Aircraft

## (1.7)

## AIRPLANES

## (1.7.1)

THE SIMILARITY LAW FOR HYPERSONIC FLOW ABOUT SLENDER THREE-DIMENSIONAL SHAPES. Frank M. Hamaker, Stanford E. Neice and A. J. Eggers, Jr. August 1951. 22p. diagrs. (NACA TN 2443)

THE SIMILARITY LAW FOR NONSTEADY HYPERSONIC FLOWS AND REQUIREMENTS FOR THE DYNAMICAL SIMILARITY OF RELATED BODIES IN FREE FLIGHT. Frank M. Hamaker and Thomas J. Wong. February 1952. 24p. diagrs. (NACA TN 2631)

ON THE CALCULATION OF FLOW ABOUT OBJECTS TRAVELING AT HIGH SUPERSONIC SPEEDS. A. J. Eggers, Jr. October 1952. 25p. diagrs. (NACA TN 2811)

COMPONENTS IN COMBINATION  
(1.7.1.1)

THEORETICAL FORCE AND MOMENTS DUE TO SIDESLIP OF A NUMBER OF VERTICAL TAIL CONFIGURATIONS AT SUPERSONIC SPEEDS. John C. Martin and Frank S. Malvestuto, Jr. September 1951. 60p. diagrs., photos. (NACA TN 2412)

ANALYSIS OF THE EFFECTS OF WING INTERFERENCE ON THE TAIL CONTRIBUTIONS TO THE ROLLING DERIVATIVES. William H. Michael, Jr. 1952. ii, 12p. diagrs. (NACA Rept. 1086. Formerly TN 2332)

WING-BODY INTERFERENCE AT SUPERSONIC SPEEDS WITH AN APPLICATION TO COMBINATIONS WITH RECTANGULAR WINGS. Jack N. Nielsen and William C. Pitts. April 1952. 63p. diagrs., 2 tabs. (NACA TN 2677)

EFFECT OF HORIZONTAL-TAIL SPAN AND VERTICAL LOCATION ON THE AERODYNAMIC CHARACTERISTICS OF AN UNSWEPT TAIL ASSEMBLY IN SIDESLIP. Donald R. Riley. February 1953. 39p. diagrs., photos., tab. (NACA TN 2907)

AN ANALYSIS OF THE FACTORS AFFECTING THE LOSS IN LIFT AND SHIFT IN AERODYNAMIC CENTER PRODUCED BY THE DISTORTION OF A SWEEP WING UNDER AERODYNAMIC LOAD. Charles W. Mathews and Max C. Kurbjun. March 1953. 65p. diagrs. (NACA TN 2901)

LANGLEY FULL-SCALE-TUNNEL TESTS OF THE CUSTER CHANNEL WING AIRPLANE. Jerome Pasamanick. April 1953. 57p. diagrs., photos., tab. (NACA RM L53A09)

A METHOD FOR CALCULATING THE AERODYNAMIC LOADING ON WING-TIP-TANK COMBINATIONS IN SUBSONIC FLOW. Samuel W. Robinson, Jr. and Martin Zlotnick. April 7, 1953. 43p. diagrs. (NACA RM L53B18) (Declassified from Restricted, 4/9/53)

Wing-Fuselage  
(1.7.1.1.1)

INVESTIGATION OF HIGH-LIFT AND STALL-CONTROL DEVICES ON AN NACA 64-SERIES 42° SWEEPBACK WING WITH AND WITHOUT FUSELAGE. Robert R. Graham and D. William Conner. October 14, 1947. 47p. diagrs., photos., 2 tabs. (NACA RM L7G09) (Declassified from Restricted, 6/25/53)

TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. I - THE EFFECT OF REYNOLDS NUMBER AND MACH NUMBER ON THE AERODYNAMIC CHARACTERISTICS OF THE WING WITH FLAP UNDEFLECTED. George G. Edwards and Jack D. Stephenson. January 22, 1948. 42p. diagrs., photos. (NACA RM A7K05) (Declassified from Restricted, 6/11/53)

HIGH-SPEED WIND-TUNNEL INVESTIGATION OF A FLYING-BOAT HULL WITH HIGH LENGTH-BEAM RATIO. John M. Riebe and Rodger L. Naeseth. June 20, 1948. 30p. diagrs., photo., 4 tabs. (NACA RM L7K28) (Declassified from Restricted, 2/28/52)

LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. I - THE EFFECT OF COMBINATION WITH A BODY OF REVOLUTION AND HEIGHT ABOVE A GROUND PLANE. Leonard M. Rose. August 27, 1948. 41p. diagrs., photos., 7 tabs. (NACA RM A7K03) (Declassified from Restricted, 6/11/53)

TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - THE EFFECTIVENESS AND HINGE MOMENTS OF A CONSTANT-CHORD PLAIN FLAP. Jack D. Stephenson and Arthur R. Amuendo. September 21, 1948. 82p. diagrs., photos., 9 tabs. (NACA RM A8E03) (Declassified from Restricted, 6/11/53)

THE EFFECT OF BOUNDARY-LAYER CONTROL BY SUCTION AND OF SEVERAL HIGH-LIFT DEVICES ON THE AERODYNAMIC CHARACTERISTICS IN YAW OF A 47.5° SWEEPBACK WING-FUSELAGE COMBINATION. Jerome Pasamanick. October 28, 1948. 36p. diagrs., photo. (NACA RM L8E21) (Declassified from Restricted, 6/29/53)

*Wing-Fuselage-Airplanes (Cont.)*

THE EFFECT OF BOUNDARY-LAYER CONTROL BY SUCTION AND SEVERAL HIGH-LIFT DEVICES ON THE LONGITUDINAL AERODYNAMIC CHARACTERISTICS OF A 47.5° SWEEPBACK WING-FUSELAGE COMBINATION. Jerome Pasamanick and Anthony J. Proterra. November 4, 1948. 44p. diagrs., photo., 2 tabs. (NACA RM L8E18) (Declassified from Restricted, 6/29/53)

AERODYNAMIC STUDY OF A WING-FUSELAGE COMBINATION EMPLOYING A WING SWEEP BACK 63° - INVESTIGATION OF A LARGE-SCALE MODEL AT LOW SPEED. Gerald M. McCormack and Walter C. Walling. January 21, 1949. 20p. diagrs., photos. (NACA RM A8D02) (Declassified from Restricted, 6/29/53)

CHORDWISE AND SPANWISE LOADINGS MEASURED AT LOW SPEED ON LARGE TRIANGULAR WINGS. Adrien E. Anderson. April 19, 1949. 78p. diagrs., photos., 2 tabs. (NACA RM A9B17) (Declassified from Restricted, 6/11/53)

EFFECTS OF BOUNDARY-LAYER CONTROL ON THE LONGITUDINAL CHARACTERISTICS OF A 45° SWEEP-FORWARD WING-FUSELAGE COMBINATION. Gerald M. McCormack and Woodrow L. Cook. February 2, 1950. 73p. diagrs., photo., 2 tabs. (NACA RM A9E02a) (Declassified from Restricted, 6/29/53)

FULL-SCALE INVESTIGATION OF BOUNDARY-LAYER CONTROL BY SUCTION THROUGH LEADING-EDGE SLOTS ON A WING-FUSELAGE CONFIGURATION HAVING 47.5° LEADING-EDGE SWEEP WITH AND WITHOUT FLAPS. Jerome Pasamanick and Thomas B. Sellers. April 5, 1950. 55p. diagrs., photo., 2 tabs. (NACA RM L50B15) (Declassified from Restricted, 6/29/53)

A METHOD FOR PREDICTING THE UPWASH ANGLES INDUCED AT THE PROPELLER PLANE OF A COMBINATION OF BODIES WITH AN UNSWEPT WING. Paul F. Yaggy. October 1951. 24p. diagrs., photos. (NACA TN 2528)

PITCHING-MOMENT DERIVATIVES  $C_{m_q}$  AND  $C_{m_{\dot{\alpha}}}$  AT SUPERSONIC SPEEDS FOR A SLENDER-DELTA-WING AND SLENDER-BODY COMBINATION AND APPROXIMATE SOLUTIONS FOR BROAD-DELTA-WING AND SLENDER-BODY COMBINATIONS. Arthur Henderson, Jr. December 1951. 29p. diagrs. (NACA TN 2553)

WING-BODY INTERFERENCE AT SUPERSONIC SPEEDS WITH AN APPLICATION TO COMBINATIONS WITH RECTANGULAR WINGS. Jack N. Nielsen and William C. Pitts. April 1952. 63p. diagrs., 2 tabs. (NACA TN 2677)

AERODYNAMIC CHARACTERISTICS OF A REFINED DEEP-STEP PLANING-TAIL FLYING-BOAT HULL WITH VARIOUS FOREBODY AND AFTERBODY SHAPES. John M. Riebe and Rodger L. Naeseth. June 1952. 48p. photos., diagrs., 8 tabs. (NACA TN 2489. Formerly RM L8F01)

EFFECTS OF WING SWEEP ON THE UPWASH AT THE PROPELLER PLANES OF MULTIENGINE AIRPLANES. Vernon L. Rogallo. September 1952. 46p. diagrs. (NACA TN 2795)

A SIMPLIFIED MATHEMATICAL MODEL FOR CALCULATING AERODYNAMIC LOADING AND DOWNWASH FOR MIDWING WING-FUSELAGE COMBINATIONS WITH WINGS OF ARBITRARY PLAN FORM. Martin Zlotnick and Samuel W. Robinson, Jr. January 16, 1953. 36p. diagrs. (NACA RM L52J27a) (Declassified from Restricted, 4/10/53)

CALCULATIONS OF UPWASH IN THE REGION ABOVE OR BELOW THE WING-CHORD PLANES OF SWEEP-BACK WING-FUSELAGE-NACELLE COMBINATIONS. Vernon L. Rogallo and John L. McCloud, III. February 1953. 15p. diagrs., photo. (NACA TN 2894)

Wing-Nacelle  
(1.7.1.1.2)

CORRELATION OF WIND-TUNNEL AND FLIGHT DETERMINATIONS OF THE BUFFET SPEED OF AN AIRPLANE EQUIPPED WITH EXTERNAL STORES. H. Norman Silvers and Kenneth P. Spreemann. March 2, 1948. 54p. diagrs., photos., tab. (NACA RM L7E20) (Declassified from Restricted, 9/16/52)

A METHOD FOR PREDICTING THE UPWASH ANGLES INDUCED AT THE PROPELLER PLANE OF A COMBINATION OF BODIES WITH AN UNSWEPT WING. Paul F. Yaggy. October 1951. 24p. diagrs., photos. (NACA TN 2528)

THE EFFECT OF A SIMULATED PROPELLER SLIPSTREAM ON THE AERODYNAMIC CHARACTERISTICS OF AN UNSWEPT WING PANEL WITH AND WITHOUT NACELLES AT MACH NUMBERS FROM 0.30 TO 0.86. Gareth H. Jordan and Richard I. Cole. September 1952. 15p. diagrs., photo. (NACA TN 2776)

EFFECTS OF WING SWEEP ON THE UPWASH AT THE PROPELLER PLANES OF MULTIENGINE AIRPLANES. Vernon L. Rogallo. September 1952. 46p. diagrs. (NACA TN 2795)

CALCULATIONS OF UPWASH IN THE REGION ABOVE OR BELOW THE WING-CHORD PLANES OF SWEEP-BACK WING-FUSELAGE-NACELLE COMBINATIONS. Vernon L. Rogallo and John L. McCloud, III. February 1953. 15p. diagrs., photo. (NACA TN 2894)

REPORT ON THE SPECIAL FIELD "INTERFERENCE" TO THE WIND-TUNNEL COMMITTEE IN FEBRUARY 1945. (Bericht über das Fachgebiet Interferenz vor dem Windkanalausschuss im Februar 1945). H. Schlichting. Includes: Compilation of Interference Systematics at the Aerodynamic Institute of the Technical Academy Braunschweig. E. Moller. May 1953. 46p. diagrs. (NACA TM 1347. Trans. from Technische Hochschule Braunschweig. Aerodynamisches Institut. Bericht 45/4)



## AERODYNAMICS 72 AIRCRAFT (1.7)

### Tail-Wing and Fuselage (1.7.1.1.3)

AERODYNAMIC CHARACTERISTICS OF AN AIRFOIL-FOREBODY SWEEP FLYING-BOAT HULL WITH A WING AND TAIL SWEEP BACK  $51.3^\circ$  AT THE LEADING EDGE. Rodger L. Naeseth and Richard G. MacLeod. September 9, 1949. 27p. diagrs., photo., tab. (NACA RM L9F08) (Declassified from Confidential, 6/11/53)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. III. CHARACTERISTICS OF WING WITH BODY AND VERTICAL TAIL. Adrien E. Anderson. October 14, 1949. 96p. diagrs., photos., 3 tabs. (NACA RM A9H04) (Declassified from Restricted, 6/11/53)

EXPERIMENTAL INVESTIGATION OF THE EFFECT OF VERTICAL-TAIL SIZE AND LENGTH AND OF FUSELAGE SHAPE AND LENGTH ON THE STATIC LATERAL STABILITY CHARACTERISTICS OF A MODEL WITH  $45^\circ$  SWEPTBACK WING AND TAIL SURFACES. M. J. Queijo and Walter D. Wolhart. 1951. ii, 29p. diagrs., photos., 4 tabs. (NACA Rept. 1049. Formerly TN 2168)

EFFECT OF HORIZONTAL-TAIL LOCATION ON LOW-SPEED STATIC LONGITUDINAL STABILITY AND DAMPING IN PITCH OF A MODEL HAVING  $45^\circ$  SWEPTBACK WING AND TAIL SURFACES. Jacob H. Lichtenstein. June 1951. 26p. diagrs., photo., 3 tabs. (NACA TN 2381)

EFFECT OF HORIZONTAL-TAIL SIZE AND TAIL LENGTH ON LOW-SPEED STATIC LONGITUDINAL STABILITY AND DAMPING IN PITCH OF A MODEL HAVING  $45^\circ$  SWEPTBACK WING AND TAIL SURFACES. Jacob H. Lichtenstein. June 1951. 32p. diagrs., photo., 3 tabs. (NACA TN 2382)

EFFECT OF FUSELAGE AND TAIL SURFACES ON LOW-SPEED YAWING CHARACTERISTICS OF A SWEPT-WING MODEL AS DETERMINED IN CURVED-FLOW TEST SECTION OF LANGLEY STABILITY TUNNEL. John D. Bird, Byron M. Jaquet and John W. Cowan. October 1951. 19p. diagrs., photo. (NACA TN 2483. Formerly RM L8G13)

EFFECTS OF WING POSITION AND HORIZONTAL-TAIL POSITION ON THE STATIC STABILITY CHARACTERISTICS OF MODELS WITH UNSWEPT AND  $45^\circ$  SWEPTBACK SURFACES WITH SOME REFERENCE TO MUTUAL INTERFERENCE. Alex Goodman. October 1951. 58p. diagrs., photos., 4 tabs. (NACA TN 2504)

EXPERIMENTAL INVESTIGATION OF THE LOW-SPEED STATIC AND YAWING STABILITY CHARACTERISTICS OF A  $45^\circ$  SWEPTBACK HIGH-WING CONFIGURATION WITH VARIOUS TWIN VERTICAL WING FINNS. Alex Goodman and Walter D. Wolhart. November 1951. 25p. diagrs., photos., 3 tabs. (NACA TN 2534)

THEORETICAL AERODYNAMIC CHARACTERISTICS OF A FAMILY OF SLENDER WING-TAIL-BODY COMBINATIONS. Harvard Lomax and Paul F. Byrd. November 1951. 75p. diagrs., 2 tabs. (NACA TN 2554)

STABILITY AND CONTROL CHARACTERISTICS OF A COMPLETE AIRPLANE MODEL HAVING A WING WITH QUARTER-CHORD LINE SWEEP BACK  $40^\circ$ , ASPECT RATIO 2.50, AND TAPER RATIO 0.42. Marvin Schuderfrei, Paul Comisarow and Kenneth W. Goodson. December 1951. 86p. photos., diagrs. (NACA TN 2482. Formerly RM L7B25)

INFLUENCE OF WING AND FUSELAGE ON THE VERTICAL-TAIL CONTRIBUTION TO THE LOW-SPEED ROLLING DERIVATIVES OF MIDWING AIRPLANE MODELS WITH  $45^\circ$  SWEPTBACK SURFACES. Walter D. Wolhart. December 1951. 55p. diagrs., photo., 3 tabs. (NACA TN 2587)

SOME EFFECTS OF FREQUENCY ON THE CONTRIBUTION OF A VERTICAL-TAIL TO THE FREE AERODYNAMIC DAMPING OF A MODEL OSCILLATING IN YAW. John D. Bird, Lewis R. Fisher and Sadie M. Hubbard. April 1952. 39p. diagrs., photo., tab. (NACA TN 2657)

INVESTIGATION OF THE INFLUENCE OF FUSELAGE AND TAIL SURFACES ON LOW-SPEED STATIC STABILITY AND ROLLING CHARACTERISTICS OF A SWEPT-WING MODEL. John D. Bird, Jacob H. Lichtenstein and Byron M. Jaquet. July 1952. 18p. diagrs., photo. (NACA TN 2741. Formerly RM L7H15)

THE CALCULATION OF PRESSURE ON SLENDER AIRPLANES IN SUBSONIC AND SUPERSONIC FLOW. Max. A. Heaslet and Harvard Lomax. March 1953. 25p. diagrs. (NACA TN 2900)

REPORT ON THE SPECIAL FIELD "INTERFERENCE" TO THE WIND-TUNNEL COMMITTEE IN FEBRUARY 1945. (Bericht über das Fachgebiet Interferenz vor dem Windkanalausschuss im Februar 1945). H. Schlichting. Includes: Compilation of Interference Systematics at the Aerodynamic Institute of the Technical Academy Braunschweig. E. Moller. May 1953. 46p. diagrs. (NACA TM 1347. Trans. from Technische Hochschule Braunschweig. Aerodynamisches Institut. Bericht 45/4)

### External Stores (1.7.1.1.5)

CORRELATION OF WIND-TUNNEL AND FLIGHT DETERMINATIONS OF THE BUFFET SPEED OF AN AIRPLANE EQUIPPED WITH EXTERNAL STORES. H. Norman Silvers and Kenneth P. Spreemann. March 2, 1948. 54p. diagrs., photos., tab. (NACA RM L7E20) (Declassified from Restricted, 9/16/52)

A METHOD FOR CALCULATING THE AERODYNAMIC LOADING ON WING-TIP-TANK COMBINATIONS IN SUBSONIC FLOW. Samuel W. Robinson, Jr. and Martin Zlotnick. April 7, 1953. 43p. diagrs. (NACA RM L53B18) (Declassified from Restricted, 4/9/53)

## SPECIFIC AIRPLANES (1.7.1.2)

**EFFECT OF MACH NUMBER ON THE MAXIMUM LIFT AND BUFFETING BOUNDARY DETERMINED IN FLIGHT ON A NORTH AMERICAN P-51D AIRPLANE.** John P. Mayer. June 12, 1947. 19p. diags., photo. (NACA RM L6110) (Declassified from Confidential, 7/3/51)

**WIND-TUNNEL INVESTIGATION OF THE STABILITY OF JETTISONED NOSE SECTIONS OF THE D-558 AIRPLANE - PHASES I AND II.** Stanley H. Scher. January 14, 1948. 33p. photos., diags., 6 tabs. (NACA RM L7K10) (Declassified from Confidential, 9/16/52)

**A STUDY OF THE USE OF EXPERIMENTAL STABILITY DERIVATIVES IN THE CALCULATION OF THE LATERAL DISTURBED MOTIONS OF A SWEEP-WING AIRPLANE AND COMPARISON WITH FLIGHT RESULTS.** John D. Bird and Byron M. Jaquet. 1951. ii, 25p. diags., photos., 4 tabs. (NACA Rept. 1031. Formerly TN 2013)

**FLIGHT INVESTIGATION OF SOME FACTORS AFFECTING THE CRITICAL TAIL LOADS ON LARGE AIRPLANES.** Harvey H. Brown. September 1951. 119p. diags., photos., 2 tabs. (NACA TN 2490)

**THE EFFECT OF RATE OF CHANGE OF ANGLE OF ATTACK ON THE MAXIMUM LIFT COEFFICIENT OF A PURSUIT AIRPLANE.** Burnett L. Gadeberg. October 1951. 17p. diags., photo. (NACA TN 2525. Formerly RM A8130)

**EFFECTS ON LONGITUDINAL STABILITY AND CONTROL CHARACTERISTICS OF A BOEING B-29 AIRPLANE OF VARIATIONS IN STICK-FORCE AND CONTROL-RATE CHARACTERISTICS OBTAINED THROUGH USE OF A BOOSTER IN THE ELEVATOR-CONTROL SYSTEM.** Charles W. Mathews, Donald B. Talmage and James B. Whitten. 1952. ii, 17p. diags., photo., tab. (NACA Rept. 1076. Formerly TN 2238; RM L50D11)

**LANGLEY FULL-SCALE-TUNNEL TESTS OF THE CUSTER CHANNEL WING AIRPLANE.** Jerome Pasamanick. April 1953. 57p. diags., photos., tab. (NACA RM L53A09)

## PERFORMANCE (1.7.1.3)

**EFFECTS OF BOUNDARY-LAYER CONTROL ON THE LONGITUDINAL CHARACTERISTICS OF A 45° SWEEP-FORWARD WING-FUSELAGE COMBINATION.** Gerald M. McCormack and Woodrow L. Cook. February 2, 1950. 73p. diags., photo., 2 tabs. (NACA RM A9K02a) (Declassified from Restricted, 6/29/53)

**ANALYSIS OF THE EFFECTS OF BOUNDARY-LAYER CONTROL ON THE TAKE-OFF AND POWER-OFF LANDING PERFORMANCE CHARACTERISTICS OF A LIAISON TYPE OF AIRPLANE.** Elmer A. Horton, Laurence K. Loftin, Jr., Stanley F. Racisz and John H. Quinn, Jr. 1951. ii, 31p. diags. (NACA Rept. 1057. Formerly TN 1597; TN 2143)

**THEORETICAL AND EXPERIMENTAL INVESTIGATION OF ADDITIVE DRAG.** Merwin Sibulkin. May 21, 1951. 33p. diags. (NACA RM E51B13) (Declassified from Confidential, 6/11/53)

**FLIGHT INVESTIGATION OF THE EFFECT OF ATMOSPHERIC TURBULENCE ON THE CLIMB PERFORMANCE OF AN AIRPLANE.** Harry Press and Herbert C. McClanahan, Jr. October 1951. 30p. diags., 5 tabs. (NACA TN 2498)

## MISSILES (1.7.2)

**A STUDY OF SEVERAL PARAMETERS CONTROLLING THE TRAJECTORIES OF A SUPERSONIC ANTIAIRCRAFT MISSILE POWERED WITH SOLID-OR LIQUID-FUEL ROCKETS.** Ralph F. Huntsberger. April 24, 1947. 42p. diags. (NACA RM A6G22) (Declassified from Restricted, 6/5/53)

**THE SIMILARITY LAW FOR HYPERSONIC FLOW ABOUT SLENDER THREE-DIMENSIONAL SHAPES.** Frank M. Hamaker, Stanford E. Neice and A. J. Eggers, Jr. August 1951. 22p. diags. (NACA TN 2443)

**BEHAVIOR OF VORTEX SYSTEM BEHIND CRUCIFORM WINGS - MOTIONS OF FULLY ROLLED-UP VORTICES.** Alvin H. Sacks. January 1952. 40p. photos., diags. (NACA TN 2605)

**THE SIMILARITY LAW FOR NONSTEADY HYPERSONIC FLOWS AND REQUIREMENTS FOR THE DYNAMICAL SIMILARITY OF RELATED BODIES IN FREE FLIGHT.** Frank M. Hamaker and Thomas J. Wong. February 1952. 24p. diags. (NACA TN 2631)

**ON THE CALCULATION OF FLOW ABOUT OBJECTS TRAVELING AT HIGH SUPERSONIC SPEEDS.** A. J. Eggers, Jr. October 1952. 25p. diags. (NACA TN 2811)

**ANALYTICAL INVESTIGATION OF ICING LIMIT FOR DIAMOND-SHAPED AIRFOIL IN TRANSONIC AND SUPERSONIC FLOW.** Edmund E. Callaghan and John S. Serafini. January 1953. 18p. diags. (NACA TN 2861)

## COMPONENTS IN COMBINATION (1.7.2.1)

**FLUTTER INVESTIGATION IN THE TRANSONIC RANGE OF SIX AIRFOILS ATTACHED TO THREE FREELY FALLING BODIES.** S. A. Clevenson and William T. Lauten, Jr. May 6, 1948. 32p. diags., photos., 2 tabs. (NACA RM L7K17) (Declassified from Restricted, 6/11/53)

**THEORETICAL DAMPING IN ROLL AND ROLLING MOMENT DUE TO DIFFERENTIAL WING INCIDENCE FOR SLENDER CRUCIFORM WINGS AND WING-BODY COMBINATIONS.** Gaynor J. Adams and Duane W. Dugan. 1952. ii, 11p. diags. (NACA Rept. 1088. Extends analysis of TN 2270)

## AERODYNAMICS

### 74 AIRCRAFT (1.7)

#### *Components in Combination - Missiles (Cont.)*

APPROXIMATE THEORY FOR CALCULATION OF LIFT OF BODIES, AFTERBODIES, AND COMBINATIONS OF BODIES. Barry Moskowitz. April 1952. 39p. diags. (NACA TN 2669)

WING-BODY INTERFERENCE AT SUPERSONIC SPEEDS WITH AN APPLICATION TO COMBINATIONS WITH RECTANGULAR WINGS. Jack N. Nielsen and William C. Pitts. April 1952. 63p. diags., 2 tabs. (NACA TN 2677)

#### Wing-Body (1.7.2.1.1)

TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. I - THE EFFECT OF REYNOLDS NUMBER AND MACH NUMBER ON THE AERODYNAMIC CHARACTERISTICS OF THE WING WITH FLAP UNDEFLECTED. George G. Edwards and Jack D. Stephenson. January 22, 1948. 42p. diags., photos. (NACA RM A7K05) (Declassified from Restricted, 6/11/53)

LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. I - THE EFFECT OF COMBINATION WITH A BODY OF REVOLUTION AND HEIGHT ABOVE A GROUND PLANE. Leonard M. Rose. August 27, 1948. 41p. diags., photos., 7 tabs. (NACA RM A7K03) (Declassified from Restricted, 6/11/53)

TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - THE EFFECTIVENESS AND HINGE MOMENTS OF A CONSTANT-CHORD PLAIN FLAP. Jack D. Stephenson and Arthur R. Amuendo. September 21, 1948. 82p. diags., photos., 9 tabs. (NACA RM A8E03) (Declassified from Restricted, 6/11/53)

PITCHING-MOMENT DERIVATIVES  $C_{m_q}$  AND  $C_{m_{\dot{\alpha}}}$  AT SUPERSONIC SPEEDS FOR A SLENDER-DELTA-WING AND SLENDER-BODY COMBINATION AND APPROXIMATE SOLUTIONS FOR BROAD-DELTA-WING AND SLENDER-BODY COMBINATIONS. Arthur Henderson, Jr. December 1951. 29p. diags. (NACA TN 2553)

WING-BODY INTERFERENCE AT SUPERSONIC SPEEDS WITH AN APPLICATION TO COMBINATIONS WITH RECTANGULAR WINGS. Jack N. Nielsen and William C. Pitts. April 1952. 63p. diags., 2 tabs. (NACA TN 2677)

#### Jet Interference (1.7.2.1.3)

TEMPERATURE SURVEY OF THE WAKE OF TWO CLOSELY LOCATED PARALLEL JETS. John L. Sloop and Gerald Morrell. February 6, 1950. 37p. diags., photos., 8 tabs. (NACA RM E9I21) (Declassified from Confidential, 3/10/52)

#### Wing-Tail-Body (1.7.2.1.4)

THEORETICAL AERODYNAMIC CHARACTERISTICS OF A FAMILY OF SLENDER WING-TAIL-BODY COMBINATIONS. Harvard Lomax and Paul F. Byrd. November 1951. 75p. diags., 2 tabs. (NACA TN 2554)

THE CALCULATION OF PRESSURE ON SLENDER AIRPLANES IN SUBSONIC AND SUPERSONIC FLOW. Max. A. Heaslet and Harvard Lomax. March 1953. 25p. diags. (NACA TN 2900)

#### SPECIFIC MISSILES (1.7.2.2)

FLIGHT TEST OF NACA FR-1-B, A LOW-ACCELERATION ROCKET-PROPELLED VEHICLE FOR TRANSONIC FLUTTER RESEARCH. Ellwyn E. Angle, Sherman A. Clevenson and Reginald R. Lundstrom. July 20, 1948. 22p. diags., photos., 3 tabs. (NACA RM L8C24) (Declassified from Restricted, 6/11/53)

## ROTATING-WING AIRCRAFT (1.7.3)

ESTIMATION OF HYDRODYNAMIC IMPACT LOADS AND PRESSURE DISTRIBUTIONS ON BODIES APPROXIMATING ELLIPTICAL CYLINDERS WITH SPECIAL REFERENCE TO WATER LANDINGS OF HELICOPTERS. Emanuel Schnitzer and Melvin E. Hathaway. April 1953. 31p. diags. (NACA TN 2889)

#### AUTOGIROS (1.7.3.1)

BIBLIOGRAPHY OF NACA PAPERS ON ROTATING-WING AIRCRAFT, JANUARY 1952. Alfred Gessow. March 1952. 13p. (NACA RM L52B18a. Formerly RM L7J30)

#### HELICOPTERS (1.7.3.2)

EFFECTS OF COMPRESSIBILITY ON THE PERFORMANCE OF TWO FULL-SCALE HELICOPTER ROTORS. Paul J. Carpenter. 1952. ii, 8p. diags., photo. (NACA Rept. 1078. Formerly TN 2277)

SOME EFFECTS OF VARYING THE DAMPING IN PITCH AND ROLL ON THE FLYING QUALITIES OF A SMALL SINGLE-ROTOR HELICOPTER. John P. Reeder and James B. Whitten. January 1952. 23p. diags., photos., 4 tabs. (NACA TN 2459)

AN INVESTIGATION OF BENDING-MOMENT DISTRIBUTION ON A MODEL HELICOPTER ROTOR BLADE AND A COMPARISON WITH THEORY. John R. Meyer, Jr., Massachusetts Institute of Technology. February 1952. 91p. diags., photos., 12 tabs. (NACA TN 2626)

*Helicopters - Rotating-Wing  
Aircraft (Cont.)*

EXPERIMENTAL INVESTIGATION OF TRANSITION OF A MODEL HELICOPTER ROTOR FROM HOVERING TO VERTICAL AUTOROTATION. S. E. Slaymaker, Robert R. Lynn and Robin B. Gray, Princeton University. March 1952. 29p. diagrs., photos. (NACA TN 2648)

BIBLIOGRAPHY OF NACA PAPERS ON ROTATING-WING AIRCRAFT, JANUARY 1952. Alfred Gessow. March 1952. 13p. (NACA RM L52B18a. Formerly RM L7J30)

AN EXTENSION OF LIFTING ROTOR THEORY TO COVER OPERATION AT LARGE ANGLES OF ATTACK AND HIGH INFLOW CONDITIONS. Alfred Gessow and Almer D. Crim. April 1952. 36p. diagrs. (NACA TN 2665)

NORMAL ACCELERATIONS AND OPERATING CONDITIONS ENCOUNTERED BY A HELICOPTER IN AIR-MAIL OPERATIONS. Almer D. Crim and Marlin E. Hazen. June 1952. 17p. diagrs., photos., 2 tabs. (NACA TN 2714)

INITIAL RESULTS OF INSTRUMENT-FLYING TRIALS CONDUCTED IN A SINGLE-ROTOR HELICOPTER. Almer D. Crim, John P. Reeder and James B. Whitten. June 1952. 16p. diagrs., photos. (NACA TN 2721)

A BLADE-ELEMENT ANALYSIS FOR LIFTING ROTORS THAT IS APPLICABLE FOR LARGE INFLOW AND BLADE ANGLES AND ANY REASONABLE BLADE GEOMETRY. Walter Castles, Jr. and Noah C. New, Georgia Institute of Technology. July 1952. 63p. diagrs., 7 tabs. (NACA TN 2656)

INSTRUMENT-FLIGHT RESULTS OBTAINED WITH A COMBINED-SIGNAL FLIGHT INDICATOR MODIFIED FOR HELICOPTER USE. Almer D. Crim, John P. Reeder and James B. Whitten. August 1952. 13p. diagrs., photos. (NACA TN 2761)

POWER-OFF FLARE-UP TESTS OF A MODEL HELICOPTER ROTOR IN VERTICAL AUTOROTATION. S. E. Slaymaker and Robin B. Gray, Princeton University. January 1953. 36p. diagrs., photos. (NACA TN 2870)

THE NORMAL COMPONENT OF THE INDUCED VELOCITY IN THE VICINITY OF A LIFTING ROTOR AND SOME EXAMPLES OF ITS APPLICATION. Walter Castles, Jr. and Jacob Henri De Leeuw, Georgia Institute of Technology. March 1953. 38p. diagrs., 3 tabs. (NACA TN 2912)

THE ATTENUATION CHARACTERISTICS OF FOUR SPECIALLY DESIGNED MUFFLERS TESTED ON A PRACTICAL ENGINE SETUP. George M. Stokes and Don D. Davis, Jr. May 1953. 30p. diagrs., photos., tab. (NACA TN 2943)

AN INVESTIGATION OF THE EXPERIMENTAL AERODYNAMIC LOADING ON A MODEL HELICOPTER ROTOR BLADE. John R. Meyer, Jr. and Gaetano Falabella, Jr., Massachusetts Institute of Technology. May 1953. 110p. diagrs., photos. (NACA TN 2953)

## SEAPLANES (1.7.4)

### GENERAL STUDIES (1.7.4.1)

AERODYNAMIC CHARACTERISTICS OF AN AIRFOIL-FOREBODY SWEEP FLYING-BOAT HULL WITH A WING AND TAIL SWEEP BACK 51.3° AT THE LEADING EDGE. Rodger L. Naeseth and Richard G. MacLeod. September 9, 1949. 27p. diagrs., photo., tab. (NACA RM L9F08)  
(Declassified from Confidential, 6/11/53)

AERODYNAMIC CHARACTERISTICS OF A REFINED DEEP-STEP PLANING-TAIL FLYING-BOAT HULL WITH VARIOUS FOREBODY AND AFTERBODY SHAPES. John M. Riebe and Rodger L. Naeseth. June 1952. 48p. photos., diagrs., 8 tabs. (NACA TN 2489. Formerly RM L8F01)

AERODYNAMIC CHARACTERISTICS OF THREE DEEP-STEP PLANING-TAIL FLYING-BOAT HULLS AND A TRANSVERSE-STEP HULL WITH EXTENDED AFTERBODY. John M. Riebe and Rodger L. Naeseth. August 1952. diagrs., photos., 5 tabs. (NACA TN 2762. Formerly RM L8I27)

## Stability and Control

### (1.8)

AN INVESTIGATION OF THE LOW-SPEED STABILITY AND CONTROL CHARACTERISTICS OF SWEEP-FORWARD AND SWEEP-BACK WINGS IN THE AMES 40- BY 80-FOOT WIND TUNNEL. Gerald M. McCormack and Victor I. Stevens, Jr. June 10, 1947. 172p. diagrs., photos., 2 tabs. (NACA RM A6K15) (Reclassified from Restricted, 7/3/51)

DYNAMICS OF MECHANICAL FEEDBACK-TYPE HYDRAULIC SERVOMOTORS UNDER INERTIA LOADS. Harold Gold, Edward W. Otto and Victor L. Ransom. August 1952. 63p. diagrs., photos. (NACA TN 2767)

OPTIMUM CONTROLLERS FOR LINEAR CLOSED-LOOP SYSTEMS. Aaron S. Boksenbom, David Novik and Herbert Heppler. April 1953. 27p. diagrs. (NACA TN 2939)

### STABILITY (1.8.1)

LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. I - THE EFFECT OF COMBINATION WITH A BODY OF REVOLUTION AND HEIGHT ABOVE A GROUND PLANE. Leonard M. Rose. August 27, 1948. 41p. diagrs., photos., 7 tabs. (NACA RM A7K03) (Declassified from Restricted, 6/11/53)

#### STATIC (1.8.1.1)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. I - CHARACTERISTICS OF A WING HAVING A DOUBLE-WEDGE AIRFOIL SECTION WITH MAXIMUM THICKNESS AT 20-PERCENT CHORD. Adrien E. Anderson. November 13, 1947. 59p. diagrs., photos., tab. (NACA RM A7F06) (Declassified from Restricted, 6 5 53)

HIGH-SPEED WIND-TUNNEL INVESTIGATION OF A FLYING-BOAT HULL WITH HIGH LENGTH-BEAM RATIO. John M. Riebe and Rodger L. Naeseth. June 20, 1948. 30p. diagrs., photo., 4 tabs. (NACA RM L7K28) (Declassified from Restricted, 2/28/52)

THE EFFECT OF BOUNDARY-LAYER CONTROL BY SUCTION AND OF SEVERAL HIGH-LIFT DEVICES ON THE AERODYNAMIC CHARACTERISTICS IN YAW OF A 47.5° SWEEPBACK WING-FUSELAGE COMBINATION. Jerome Pasamanick. October 28, 1948. 36p. diagrs., photo. (NACA RM L8E21) (Declassified from Restricted, 6/29/53)

EFFECTS OF WING POSITION AND HORIZONTAL-TAIL POSITION ON THE STATIC STABILITY CHARACTERISTICS OF MODELS WITH UNSWEPT AND 45° SWEEPBACK SURFACES WITH SOME REFERENCE TO MUTUAL INTERFERENCE. Alex Goodman. October 1951. 58p. diagrs., photos., 4 tabs. (NACA TN 2504)

EXPERIMENTAL INVESTIGATION OF THE LOW-SPEED STATIC AND YAWING STABILITY CHARACTERISTICS OF A 45° SWEEPBACK HIGH-WING CONFIGURATION WITH VARIOUS TWIN VERTICAL WING FINS. Alex Goodman and Walter D. Wolhart. November 1951. 25p. diagrs., photos., 3 tabs. (NACA TN 2534)

EFFECT OF TAPER RATIO ON THE LOW-SPEED ROLLING STABILITY DERIVATIVES OF SWEEPED AND UNSWEPT WINGS OF ASPECT RATIO 2.61. Jack D. Brewer and Lewis R. Fisher. November 1951. 17p. diagrs., photo. (NACA TN 2555. Formerly RM L8H18)

STABILITY AND CONTROL CHARACTERISTICS OF A COMPLETE AIRPLANE MODEL HAVING A WING WITH QUARTER-CHORD LINE SWEEP BACK 40°, ASPECT RATIO 2.50, AND TAPER RATIO 0.42. Marvin Schulderfrei, Paul Comisarow and Kenneth W. Goodson. December 1951. 86p. photos., diagrs. (NACA TN 2482. Formerly RM L7B25)

INVESTIGATION OF THE INFLUENCE OF FUSELAGE AND TAIL SURFACES ON LOW-SPEED STATIC STABILITY AND ROLLING CHARACTERISTICS OF A SWEEP-WING MODEL. John D. Bird, Jacob H. Lichtenstein and Byron M. Jaquet. July 1952. 18p. diagrs., photo. (NACA TN 2741. Formerly RM L7H15)

AERODYNAMIC CHARACTERISTICS OF THREE DEEP-STEP PLANING-TAIL FLYING-BOAT HULLS AND A TRANSVERSE-STEP HULL WITH EXTENDED AFTERBODY. John M. Riebe and Rodger L. Naeseth. August 1952. diagrs., photos., 5 tabs. (NACA TN 2762. Formerly RM L8I27)

STEADY VIBRATIONS OF WING OF CIRCULAR PLAN FORM. (Ob ustanovivshikhsya kolebaniyakh kryla krugovoi formy v plane). THEORY OF WING OF CIRCULAR PLAN FORM. (Teoriya kryla konechnogo razmakha krugovoi formy v plane). N. E. Kochin. January 1953. 93p. diagrs. (NACA TM 1324. Trans. from: Prikladnaya Matematika i Mekhanika, v. 6, no. 4, 1942, p. 287-316; Prikladnaya Matematika i Mekhanika, v. 4, no. 1, 1940, p. 3-32).

LANGLEY FULL-SCALE-TUNNEL TESTS OF THE CUSTER CHANNEL WING AIRPLANE. Jerome Pasamanick. April 1953. 57p. diagrs., photos., tab. (NACA RM L53A09)

**Static Stability (Cont.)**

REPORT ON THE SPECIAL FIELD "INTERFERENCE" TO THE WIND-TUNNEL COMMITTEE IN FEBRUARY 1945. (Bericht über das Fachgebiet Interferenz vor dem Windkanalausschuss im Februar 1945). H. Schlichting. Includes: Compilation of Interference Systematics at the Aerodynamic Institute of the Technical Academy Braunschweig. E. Moller. May 1953. 46p. diagrs. (NACA TM 1347. Trans. from Technische Hochschule Braunschweig. Aerodynamisches Institut. Bericht 45/4)

**Longitudinal  
(1.8.1.1.1)**

INVESTIGATION OF THE CHARACTERISTICS OF A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Richard T. Whitcomb. August 28, 1946. 77p. diagrs., photos., 3 tabs. (NACA RM L6H28a) (Declassified from Restricted, 6/5/53)

AN INVESTIGATION OF A HIGH-ASPECT-RATIO WING HAVING 0.20-CHORD PLAIN AILERONS IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Arvo A. Luoma. August 28, 1946. 124p. diagrs., photos., 2 tabs. (NACA RM L6H28d) (Declassified from Restricted, 6/5/53)

INVESTIGATION AT HIGH SPEEDS OF A HORIZONTAL-TAIL MODEL IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Ralph P. Bielat. January 31, 1947. 102p. diagrs., 3 tabs. (NACA RM L6L10b) (Declassified from Restricted, 6/5/53)

LONGITUDINAL STABILITY AND CONTROL OF HIGH-SPEED AIRPLANES WITH PARTICULAR REFERENCE TO DIVE RECOVERY. John A. Axelson. September 4, 1947. 25p. diagrs. (NACA RM A7C24) (Reclassified from Restricted, 6/27/51)

WING-FLOW TESTS OF A TRIANGULAR WING OF ASPECT RATIO TWO. I. EFFECTIVENESS OF SEVERAL TYPES OF TRAILING-EDGE FLAPS ON FLAT-PLATE MODELS. George A. Rathert, Jr. and George E. Cooper. November 14, 1947. 61p. diagrs., photos. (NACA RM A7G18) (Declassified from Confidential, 6/5/53)

FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS. Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diagrs., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. I - THE EFFECT OF REYNOLDS NUMBER AND MACH NUMBER ON THE AERODYNAMIC CHARACTERISTICS OF THE WING WITH FLAP UNDEFLECTED. George G. Edwards and Jack D. Stephenson. January 22, 1948. 42p. diagrs., photos. (NACA RM A7K05) (Declassified from Restricted, 6/11/53)

AN INVESTIGATION OF THE DOWNWASH AND WAKE BEHIND LARGE-SCALE SWEEPED AND UNSWEEPED WINGS. William H. Tolhurst, Jr. February 2, 1948. 25p. diagrs., photo. (NACA RM A7L05) (Declassified from Restricted, 6/11/53)

LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. III - STATIC STABILITY WITH TWIN VERTICAL FINS. Leonard M. Rose. August 24, 1948. 11p. diagrs. (NACA RM A8C03) (Declassified from Restricted, 6/11/53)

LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. I - THE EFFECT OF COMBINATION WITH A BODY OF REVOLUTION AND HEIGHT ABOVE A GROUND PLANE. Leonard M. Rose. August 27, 1948. 41p. diagrs., photos., 7 tabs. (NACA RM A7K03) (Declassified from Restricted, 6/11/53)

TESTS OF A TRIANGULAR WING OF ASPECT RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - THE EFFECTIVENESS AND HINGE MOMENTS OF A CONSTANT-CHORD PLAIN FLAP. Jack D. Stephenson and Arthur R. Amuendo. September 21, 1948. 82p. diagrs., photos., 9 tabs. (NACA RM A8E03) (Declassified from Restricted, 6/11/53)

THE EFFECT OF BOUNDARY-LAYER CONTROL BY SUCTION AND SEVERAL HIGH-LIFT DEVICES ON THE LONGITUDINAL AERODYNAMIC CHARACTERISTICS OF A 47.5° SWEEPBACK WING-FUSELAGE COMBINATION. Jerome Pasamanick and Anthony J. Proterra. November 4, 1948. 44p. diagrs., photo., 2 tabs. (NACA RM L8E18) (Declassified from Restricted, 6/29/53)

EFFECT OF AIRFOIL PROFILE OF SYMMETRICAL SECTIONS ON THE LOW-SPEED STATIC-STABILITY AND YAWING DERIVATIVES OF 45° SWEEPBACK WING MODELS OF ASPECT RATIO 2.61. William Letko and Byron M. Jaquet. November 9, 1948. 21p. diagrs., photo., tab. (NACA RM L8H10) (Declassified from Restricted, 3/10/52)

AERODYNAMIC CHARACTERISTICS OF FLYING-BOAT HULLS HAVING LENGTH-BEAM RATIOS OF 20 AND 30. John M. Riebe. November 10, 1948. 26p. diagrs., photos., 4 tabs. (NACA RM L8H11) (Declassified from Restricted, 9/16/52)

THE EFFECT OF NEGATIVE DIHEDRAL, TIP DROOP, AND WING-TIP SHAPE ON THE LOW-SPEED AERODYNAMIC CHARACTERISTICS OF A COMPLETE MODEL HAVING A 45° SWEEPBACK WING. M. Leroy Spearman and Robert E. Becht. December 6, 1948. 50p. diagrs., photo., tab. (NACA RM L8J07) (Declassified from Restricted, 3/10/52)

PRESENT STATUS OF RESEARCH-ON BOUNDARY-LAYER CONTROL. Albert E. von Doenhoff and Laurence K. Loftin, Jr. January 12, 1949. 40p. diagrs. (NACA RM L8J29) (Declassified from Confidential, 6/29/53)

AERODYNAMIC STUDY OF A WING-FUSELAGE COMBINATION EMPLOYING A WING SWEEP BACK 63° - INVESTIGATION OF A LARGE-SCALE MODEL AT LOW SPEED. Gerald M. McCormack and Walter C. Walling. January 21, 1949. 20p. diagrs., photos. (NACA RM A8D02) (Declassified from Restricted, 6/29/53)

## AERODYNAMICS 78 STABILITY AND CONTROL (1.8)

### *Longitudinal Static Stability* (Cont.)

EFFECTS OF SEVERAL LEADING-EDGE MODIFICATIONS ON THE STALLING CHARACTERISTICS OF A 45° SWEEP-FORWARD WING. Gerald M. McCormack and Woodrow L. Cook. June 14, 1949. 46p. diags., photo., tab. (NACA RM A9D29) (Reclassified from Restricted, 7/3/51)

AERODYNAMIC CHARACTERISTICS OF AN AIRFOIL-FOREBODY SWEEP FLYING-BOAT HULL WITH A WING AND TAIL SWEEP BACK 51.3° AT THE LEADING EDGE. Rodger L. Naeseth and Richard G. MacLeod. September 9, 1949. 27p. diags., photo., tab. (NACA RM L9F08) (Declassified from Confidential, 6/11/53)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. III. CHARACTERISTICS OF WING WITH BODY AND VERTICAL TAIL. Adrien E. Anderson. October 14, 1949. 96p. diags., photos., 3 tabs. (NACA RM A9H04) (Declassified from Restricted, 6/11/53)

CALCULATION OF THE AERODYNAMIC LOADING OF SWEEP AND UNSWEEP FLEXIBLE WINGS OF ARBITRARY STIFFNESS. Franklin W. Diederich. 1950. ii, 29p. diags., 10 tabs. (NACA Rept. 1000. Formerly RM L8G27a, TN 1876)

EFFECTS OF BOUNDARY-LAYER CONTROL ON THE LONGITUDINAL CHARACTERISTICS OF A 45° SWEEP-FORWARD WING-FUSELAGE COMBINATION. Gerald M. McCormack and Woodrow L. Cook. February 2, 1950. 73p. diags., photo., 2 tabs. (NACA RM A9K02a) (Declassified from Restricted, 6/29/53)

FULL-SCALE INVESTIGATION OF BOUNDARY-LAYER CONTROL BY SUCTION THROUGH LEADING-EDGE SLOTS ON A WING-FUSELAGE CONFIGURATION HAVING 47.5° LEADING-EDGE SWEEP WITH AND WITHOUT FLAPS. Jerome Pasamanick and Thomas B. Sellers. April 5, 1950. 55p. diags., photo., 2 tabs. (NACA RM L50B15) (Declassified from Restricted, 6/29/53)

AN INVESTIGATION OF THE EFFECTS OF JET-OUTLET CUTOFF ANGLE ON THRUST DIRECTION AND BODY PITCHING MOMENT. James R. Blackaby. June 1951. 39p. diags., photos., tab. (NACA TN 2379)

EFFECT OF HORIZONTAL-TAIL LOCATION ON LOW-SPEED STATIC LONGITUDINAL STABILITY AND DAMPING IN PITCH OF A MODEL HAVING 45° SWEEPBACK WING AND TAIL SURFACES. Jacob H. Lichtenstein. June 1951. 26p. diags., photo., 3 tabs. (NACA TN 2381)

EFFECT OF HORIZONTAL-TAIL SIZE AND TAIL LENGTH ON LOW-SPEED STATIC LONGITUDINAL STABILITY AND DAMPING IN PITCH OF A MODEL HAVING 45° SWEEPBACK WING AND TAIL SURFACES. Jacob H. Lichtenstein. June 1951. 32p. diags., photo., 3 tabs. (NACA TN 2382)

WIND-TUNNEL INVESTIGATION AND ANALYSIS OF THE EFFECTS OF END PLATES ON THE AERODYNAMIC CHARACTERISTICS OF AN UNSWEEP WING. Donald R. Riley. August 1951. 55p. diags., photo., 2 tabs. (NACA TN 2440)

FLIGHT INVESTIGATION OF SOME FACTORS AFFECTING THE CRITICAL TAIL LOADS ON LARGE AIRPLANES. Harvey H. Brown. September 1951. 119p. diags., photos., 2 tabs. (NACA TN 2490)

EFFECT OF FUSELAGE AND TAIL SURFACES ON LOW-SPEED YAWING CHARACTERISTICS OF A SWEEP-WING MODEL AS DETERMINED IN CURVED-FLOW TEST SECTION OF LANGLEY STABILITY TUNNEL. John D. Bird, Byron M. Jaquet and John W. Cowan. October 1951. 19p. diags., photo. (NACA TN 2483. Formerly RM L8G13)

FLIGHT INVESTIGATION OF A MECHANICAL FEEL DEVICE IN AN IRREVERSIBLE ELEVATOR CONTROL SYSTEM OF A LARGE AIRPLANE. B. Porter Brown, Robert G. Chilton and James B. Whitten. October 1951. 47p. diags., photos. (NACA TN 2496)

INFLUENCE OF STATIC LONGITUDINAL STABILITY ON THE BEHAVIOR OF AIRPLANES IN GUSTS. (Einfluss der statischen Längsstabilität auf das Verhalten eines Flugzeuges in Böen). H. Hoene. November 1951. 26p. diags. (NACA TM 1323. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1422, December 31, 1940).

EFFECTS ON LONGITUDINAL STABILITY AND CONTROL CHARACTERISTICS OF A BOEING B-29 AIRPLANE OF VARIATIONS IN STICK-FORCE AND CONTROL-RATE CHARACTERISTICS OBTAINED THROUGH USE OF A BOOSTER IN THE ELEVATOR-CONTROL SYSTEM. Charles W. Mathews, Donald B. Talmage and James B. Whitten. 1952. ii, 17p. diags., photo., tab. (NACA Rept. 1076. Formerly TN 2238; RM L50D11)

CHARTS AND APPROXIMATE FORMULAS FOR THE ESTIMATION OF AEROELASTIC EFFECTS ON THE LOADING OF SWEEP AND UNSWEEP WINGS. Franklin W. Diederich and Kenneth A. Foss. February 1952. 98p. diags., 3 tabs. (NACA TN 2608)

AERODYNAMIC CHARACTERISTICS OF A REFINED DEEP-STEP PLANING-TAIL FLYING-BOAT HULL WITH VARIOUS FOREBODY AND AFTERBODY SHAPES. John M. Riebe and Rodger L. Naeseth. June 1952. 48p. photos., diags., 8 tabs. (NACA TN 2489. Formerly RM L8F01)

EFFECT OF LINEAR SPANWISE VARIATIONS OF TWIST AND CIRCULAR-ARC CAMBER ON LOW-SPEED STATIC STABILITY, ROLLING, AND YAWING CHARACTERISTICS OF A 45° SWEEPBACK WING OF ASPECT RATIO 4 AND TAPER RATIO 0.6. Byron M. Jaquet. August 1952. 27p. diags., 2 tabs. (NACA TN 2775)

LANGLEY FULL-SCALE-TUNNEL INVESTIGATION OF THE MAXIMUM-LIFT AND STALLING CHARACTERISTICS OF A TRAPEZOIDAL WING OF ASPECT RATIO 4 WITH CIRCULAR-ARC AIRFOIL SECTIONS. Roy H. Lange. November 1952. 24p. diags., photos. (NACA TN 2823. Formerly RM L7H19)

MEASUREMENTS OF FLYING QUALITIES OF AN F-47D-30 AIRPLANE TO DETERMINE LONGITUDINAL STABILITY AND CONTROL AND STALLING CHARACTERISTICS. Christopher C. Kraft, Jr., R. Fabian Goranson and John P. Reeder. February 1953. 75p. photos., diags., 2 tabs. (NACA TN 2899)

*Longitudinal Static Stability*  
(Cont.)

AN ANALYSIS OF THE FACTORS AFFECTING THE LOSS IN LIFT AND SHIFT IN AERODYNAMIC CENTER PRODUCED BY THE DISTORTION OF A SWEPT WING UNDER AERODYNAMIC LOAD. Charles W. Mathews and Max C. Kurbjun. March 1953. 65p. diagrs. (NACA TN 2901)

Lateral  
(1.8.1.1.2)

AN INVESTIGATION OF A HIGH-ASPECT-RATIO WING HAVING 0.20-CHORD PLAIN AILERONS IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Arvo A. Luoma. August 28, 1946. 124p. diagrs., photos., 2 tabs. (NACA RM L6H28d) (Declassified from Restricted, 6/5/53)

FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS. Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diagrs., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. III - STATIC STABILITY WITH TWIN VERTICAL FINS. Leonard M. Rose. August 24, 1948. 11p. diagrs. (NACA RM A8C03) (Declassified from Restricted, 6/11/53)

EFFECT OF AIRFOIL PROFILE OF SYMMETRICAL SECTIONS ON THE LOW-SPEED STATIC-STABILITY AND YAWING DERIVATIVES OF 45° SWEPTBACK WING MODELS OF ASPECT RATIO 2.61. William Letko and Byron M. Jaquet. November 9, 1948. 21p. diagrs., photo., tab. (NACA RM L8H10) (Declassified from Restricted, 3/10/52)

THE EFFECT OF NEGATIVE DIHEDRAL, TIP DROOP, AND WING-TIP SHAPE ON THE LOW-SPEED AERODYNAMIC CHARACTERISTICS OF A COMPLETE MODEL HAVING A 45° SWEPTBACK WING. M. Leroy Spearman and Robert E. Becht. December 6, 1948. 50p. diagrs., photo., tab. (NACA RM L8J07) (Declassified from Restricted, 3/10/52)

AERODYNAMIC STUDY OF A WING-FUSELAGE COMBINATION EMPLOYING A WING SWEPT BACK 63° - INVESTIGATION OF A LARGE-SCALE MODEL AT LOW SPEED. Gerald M. McCormack and Walter C. Walling. January 21, 1949. 20p. diagrs., photos. (NACA RM A8D02) (Declassified from Restricted, 6/29/53)

AERODYNAMIC CHARACTERISTICS OF AN AIRFOIL-FOREBODY SWEPT FLYING-BOAT HULL WITH A WING AND TAIL SWEPT BACK 51.3° AT THE LEADING EDGE. Rodger L. Naeseth and Richard G. MacLeod. September 9, 1949. 27p. diagrs., photo., tab. (NACA RM L9F08) (Declassified from Confidential, 6/11/53)

AN INVESTIGATION AT LOW SPEED OF A LARGE-SCALE TRIANGULAR WING OF ASPECT RATIO TWO. III. CHARACTERISTICS OF WING WITH BODY AND VERTICAL TAIL. Adrien E. Anderson. October 14, 1949. 96p. diagrs., photos., 3 tabs. (NACA RM A9H04) (Declassified from Restricted, 6/11/53)

A STUDY OF THE USE OF EXPERIMENTAL STABILITY DERIVATIVES IN THE CALCULATION OF THE LATERAL DISTURBED MOTIONS OF A SWEPT-WING AIRPLANE AND COMPARISON WITH FLIGHT RESULTS. John D. Bird and Byron M. Jaquet. 1951. ii, 25p. diagrs., photos., 4 tabs. (NACA Rept. 1031. Formerly TN 2013)

EXPERIMENTAL INVESTIGATION OF THE EFFECT OF VERTICAL-TAIL SIZE AND LENGTH AND OF FUSELAGE SHAPE AND LENGTH ON THE STATIC LATERAL STABILITY CHARACTERISTICS OF A MODEL WITH 45° SWEPTBACK WING AND TAIL SURFACES. M. J. Queijo and Walter D. Wolhart. 1951. ii, 29p. diagrs., photos., 4 tabs. (NACA Rept. 1049. Formerly TN 2168)

A SUMMARY OF LATERAL-STABILITY DERIVATIVES CALCULATED FOR WING PLAN FORMS IN SUPERSONIC FLOW. Arthur L. Jones and Alberta Alksne. 1951. ii, 35p. diagrs., 3 tabs. (NACA Rept. 1052)

SUMMARY OF METHODS FOR CALCULATING DYNAMIC LATERAL STABILITY AND RESPONSE AND FOR ESTIMATING LATERAL STABILITY DERIVATIVES. John P. Campbell and Marion O. McKinney. July 1951. 97p. diagrs., 2 tabs. (NACA TN 2409)

EFFECT OF HIGH-LIFT DEVICES ON THE LOW-SPEED STATIC LATERAL AND YAWING STABILITY CHARACTERISTICS OF AN UNTAPERED 45° SWEPTBACK WING. Jacob H. Lichtenstein. May 1952. 20p. diagrs., photo. (NACA TN 2689. Formerly RM L8G20)

MEASUREMENTS OF FLYING QUALITIES OF AN F-47D-30 AIRPLANE TO DETERMINE LATERAL AND DIRECTIONAL STABILITY AND CONTROL CHARACTERISTICS. R. Fabian Goranson and Christopher C. Kraft, Jr. July 1952. 61p. diagrs., photos., 2 tabs. (NACA TN 2675)

EFFECT OF LINEAR SPANWISE VARIATIONS OF TWIST AND CIRCULAR-ARC CAMBER ON LOW-SPEED STATIC STABILITY, ROLLING, AND YAWING CHARACTERISTICS OF A 45° SWEPTBACK WING OF ASPECT RATIO 4 AND TAPER RATIO 0.6. Byron M. Jaquet. August 1952. 27p. diagrs., 2 tabs. (NACA TN 2775)

EFFECT OF HIGH-LIFT DEVICES ON THE STATIC-LATERAL-STABILITY DERIVATIVES OF A 45° SWEPTBACK WING OF ASPECT RATIO 4.0 AND TAPER RATIO 0.6 IN COMBINATION WITH A BODY. Jacob H. Lichtenstein and James L. Williams. November 1952. 50p. diagrs., photos., 5 tabs. (NACA TN 2819)

EFFECT OF HORIZONTAL-TAIL SPAN AND VERTICAL LOCATION ON THE AERODYNAMIC CHARACTERISTICS OF AN UNSWEPT TAIL ASSEMBLY IN SIDESLIP. Donald R. Riley. February 1953. 39p. diagrs., photos., tab. (NACA TN 2907)



**AERODYNAMICS**  
**80 STABILITY AND CONTROL (1.8)**

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**Directional**  
**(1.8.1.1.3)**

**FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS.** Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diags., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

**LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. III - STATIC STABILITY WITH TWIN VERTICAL FINS.** Leonard M. Rose. August 24, 1948. 11p. diags. (NACA RM A8C03) (Declassified from Restricted, 6/11/53)

**LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. I - THE EFFECT OF COMBINATION WITH A BODY OF REVOLUTION AND HEIGHT ABOVE A GROUND PLANE.** Leonard M. Rose. August 27, 1948. 41p. diags., photos., 7 tabs. (NACA RM A7K03) (Declassified from Restricted, 6/11/53)

**EFFECT OF AIRFOIL PROFILE OF SYMMETRICAL SECTIONS ON THE LOW-SPEED STATIC-STABILITY AND YAWING DERIVATIVES OF 45° SWEEPBACK WING MODELS OF ASPECT RATIO 2.61.** William Letko and Byron M. Jaquet. November 9, 1948. 21p. diags., photo., tab. (NACA RM L8H10) (Declassified from Restricted, 3/10/52)

**AERODYNAMIC CHARACTERISTICS OF FLYING-BOAT HULLS HAVING LENGTH-BEAM RATIOS OF 20 AND 30.** John M. Riebe. November 10, 1948. 28p. diags., photos., 4 tabs. (NACA RM L8H11) (Declassified from Restricted, 9/16/52)

**THE EFFECT OF NEGATIVE DIHEDRAL, TIP DROOP, AND WING-TIP SHAPE ON THE LOW-SPEED AERODYNAMIC CHARACTERISTICS OF A COMPLETE MODEL HAVING A 45° SWEEPBACK WING.** M. Leroy Spearman and Robert E. Becht. December 6, 1948. 50p. diags., photo., tab. (NACA RM L8J07) (Declassified from Restricted, 3/10/52)

**AERODYNAMIC STUDY OF A WING-FUSELAGE COMBINATION EMPLOYING A WING SWEEP BACK 63° - INVESTIGATION OF A LARGE-SCALE MODEL AT LOW SPEED.** Gerald M. McCormack and Walter C. Walling. January 21, 1949. 20p. diags., photos. (NACA RM A8D02) (Declassified from Restricted, 6/29/53)

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**A STUDY OF THE USE OF EXPERIMENTAL STABILITY DERIVATIVES IN THE CALCULATION OF THE LATERAL DISTURBED MOTIONS OF A SWEEP-WING AIRPLANE AND COMPARISON WITH FLIGHT RESULTS.** John D. Bird and Byron M. Jaquet. 1951. ii, 25p. diags., photos., 4 tabs. (NACA Rept. 1031. Formerly TN 2013)

**EXPERIMENTAL INVESTIGATION OF THE EFFECT OF VERTICAL-TAIL SIZE AND LENGTH AND OF FUSELAGE SHAPE AND LENGTH ON THE STATIC LATERAL STABILITY CHARACTERISTICS OF A MODEL WITH 45° SWEEPBACK WING AND TAIL SURFACES.** M. J. Queijo and Walter D. Wolhart. 1951. ii, 29p. diags., photos., 4 tabs. (NACA Rept. 1049. Formerly TN 2168)

**SUMMARY OF METHODS FOR CALCULATING DYNAMIC LATERAL STABILITY AND RESPONSE AND FOR ESTIMATING LATERAL STABILITY DERIVATIVES.** John P. Campbell and Marion O. McKinney. July 1951. 97p. diags., 2 tabs. (NACA TN 2409)

**FLIGHT INVESTIGATION OF SOME FACTORS AFFECTING THE CRITICAL TAIL LOADS ON LARGE AIRPLANES.** Harvey H. Brown. September 1951. 119p. diags., photos., 2 tabs. (NACA TN 2490)

**WIND-TUNNEL INVESTIGATION OF THE CONTRIBUTION OF A VERTICAL TAIL TO THE DIRECTIONAL STABILITY OF A FIGHTER-TYPE AIRPLANE.** Alfred A. Marino and N. Mastrocola. January 1952. 41p. diags., photo., 4 tabs. (NACA TN 2488. Formerly RM L7K03)

**SOME EFFECTS OF FREQUENCY ON THE CONTRIBUTION OF A VERTICAL TAIL TO THE FREE AERODYNAMIC DAMPING OF A MODEL OSCILLATING IN YAW.** John D. Bird, Lewis R. Fisher and Sadie M. Hubbard. April 1952. 39p. diags., photo., tab. (NACA TN 2657)

**EFFECT OF HIGH-LIFT DEVICES ON THE LOW-SPEED STATIC LATERAL AND YAWING STABILITY CHARACTERISTICS OF AN UNTAPERED 45° SWEEPBACK WING.** Jacob H. Lichtenstein. May 1952. 20p. diags., photo. (NACA TN 2689. Formerly RM L8G20)

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**MEASUREMENTS OF FLYING QUALITIES OF AN F-47D-30 AIRPLANE TO DETERMINE LATERAL AND DIRECTIONAL STABILITY AND CONTROL CHARACTERISTICS.** R. Fabian Goranson and Christopher C. Kraft, Jr. July 1952. 61p. diags., photos., 2 tabs. (NACA TN 2675)

**EFFECT OF LINEAR SPANWISE VARIATIONS OF TWIST AND CIRCULAR-ARC CAMBER ON LOW-SPEED STATIC STABILITY, ROLLING, AND YAWING CHARACTERISTICS OF A 45° SWEEPBACK WING OF ASPECT RATIO 4 AND TAPER RATIO 0.6.** Byron M. Jaquet. August 1952. 27p. diags., 2 tabs. (NACA TN 2775)

**Directional Static Stability  
(Cont.)**

EFFECT OF HIGH-LIFT DEVICES ON THE STATIC-LATERAL-STABILITY DERIVATIVES OF A  $45^\circ$  SWEEPBACK WING OF ASPECT RATIO 4.0 AND TAPER RATIO 0.6 IN COMBINATION WITH A BODY. Jacob H. Lichtenstein and James L. Williams. November 1952. 50p. diagrs., photos., 5 tabs. (NACA TN 2819)

THEORETICAL CALCULATION OF THE PRESSURE DISTRIBUTION, SPAN LOADING, AND ROLLING MOMENT DUE TO SIDESLIP AT SUPERSONIC SPEEDS FOR THIN SWEEPBACK TAPERED WINGS WITH SUPERSONIC TRAILING EDGES AND WING TIPS PARALLEL TO THE AXIS OF WING SYMMETRY. Kenneth Margolis, Windsor L. Sherman and Margery E. Hannah. February 1953. 70p. diagrs., tab. (NACA TN 2898)

A LOW-SPEED EXPERIMENTAL STUDY OF THE DIRECTIONAL CHARACTERISTICS OF A SHARP-NOSED FUSELAGE THROUGH A LARGE ANGLE-OF-ATTACK RANGE AT ZERO ANGLE OF SIDESLIP. William Letko. March 1953. 27p. diagrs., photo. (NACA TN 2911. Formerly RM L52J14)

**DYNAMIC  
(1.8.1.2)**

A STUDY OF THE USE OF EXPERIMENTAL STABILITY DERIVATIVES IN THE CALCULATION OF THE LATERAL DISTURBED MOTIONS OF A SWEEP-WING AIRPLANE AND COMPARISON WITH FLIGHT RESULTS. John D. Bird and Byron M. Jaquet. 1951. ii, 25p. diagrs., photos., 4 tabs. (NACA Rept. 1031. Formerly TN 2013)

BENCH-TEST INVESTIGATION OF THE TRANSIENT-RESPONSE CHARACTERISTICS OF SEVERAL SIMULATED AIRPLANES INCORPORATING AN AUTOPILOT SENSITIVE TO YAWING ACCELERATIONS. Donald A. Howard. July 1951. 27p. diagrs., photos., 2 tabs. (NACA TN 2395)

A GRAPHICAL METHOD FOR PLOTTING AMPLITUDE AND PHASE ANGLE OF TRANSFER FUNCTIONS OF DYNAMIC SYSTEMS WITHOUT FACTORING POLYNOMIALS. Earl F. Smith. November 1951. 35p. diagrs., 4 tabs. (NACA TN 2522)

FLIGHT INVESTIGATION OF THE EFFECT OF CONTROL CENTERING SPRINGS ON THE APPARENT SPIRAL STABILITY OF A PERSONAL-OWNER AIRPLANE. John P. Campbell, Paul A. Hunter, Donald E. Hewes and James B. Whitten. 1952. ii, 17p. diagrs., photo., 2 tabs. (NACA Rept. 1092. Formerly TN 2413)

A DESCRIPTION AND A COMPARISON OF CERTAIN NONLINEAR CURVE-FITTING TECHNIQUES, WITH APPLICATIONS TO THE ANALYSIS OF TRANSIENT-RESPONSE DATA. Marvin Shinbrot. February 1952. 41p. diagrs., 5 tabs. (NACA TN 2622)

ON THE REPRESENTATION OF THE STABILITY REGION IN OSCILLATION PROBLEMS WITH THE AID OF THE HURWITZ DETERMINANTS. (Zur Darstellung des Stabilitätsgebietes bei Schwingungsaufgaben mit Hilfe der Hurwitz-Determinanten). E. Sponder. August 1952. 12p. diagrs. (NACA TM 1348. Trans from Schweizer Archiv für angewandte Wissenschaft und Technik, v. 16, no. 3, March 1950, p. 93-96).

AN ANALYSIS OF THE ERRORS IN CURVE-FITTING PROBLEMS WITH AN APPLICATION TO THE CALCULATION OF STABILITY PARAMETERS FROM FLIGHT DATA. Marvin Shinbrot. November 1952. 29p. diagrs., 2 tabs. (NACA TN 2820)

A THEORETICAL METHOD OF ANALYZING THE EFFECTS OF YAW-DAMPER DYNAMICS ON THE STABILITY OF AN AIRCRAFT EQUIPPED WITH A SECOND-ORDER YAW DAMPER. Albert A. Schy and Ordway B. Gates, Jr. December 1952. 72p. diagrs., 2 tabs. (NACA TN 2857)

STEADY VIBRATIONS OF WING OF CIRCULAR PLAN FORM. (Ob ustanovivshikhsya kolebaniyakh kryla krugovoi formy v plane). THEORY OF WING OF CIRCULAR PLAN FORM. (Teoriya kryla konechnogo razmakha krugovoi formy v plane). N. E. Kochin. January 1953. 93p. diagrs. (NACA TM 1324. Trans. from: Prikladnaya Matematika i Mekhanika, v. 6, no. 4, 1942, p. 287-316; Prikladnaya Matematika i Mekhanika, v. 4, no. 1, 1940, p. 3-32).

STUDY OF MOTION OF MODEL OF PERSONAL-OWNER OR LIAISON AIRPLANE THROUGH THE STALL AND INTO THE INCIPIENT SPIN BY MEANS OF A FREE-FLIGHT TESTING TECHNIQUE. Ralph W. Stone, Jr., William G. Garner and Lawrence J. Gale. April 1953. 28p. diagrs., photos., tab. (NACA TN 2923)

**Longitudinal  
(1.8.1.2.1)**

FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS. Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diagrs., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

WIND-TUNNEL INVESTIGATION OF THE STABILITY OF JETTISONED NOSE SECTIONS OF THE D-558 AIRPLANE - PHASES I AND II. Stanley H. Scher. January 14, 1948. 33p. photos., diagrs., 6 tabs. (NACA RM L7K10) (Declassified from Confidential, 9/16/52)

WIND-TUNNEL INVESTIGATION AT LOW SPEEDS OF THE PITCHING DERIVATIVES OF UNTAPERED SWEEP WINGS. Robert MacLachlan and Lewis R. Fisher. September 29, 1948. 22p. diagrs., photo., tab. (NACA RM L8G19) (Declassified from Restricted, 3/10/52)

EFFECT OF HORIZONTAL-TAIL LOCATION ON LOW-SPEED STATIC LONGITUDINAL STABILITY AND DAMPING IN PITCH OF A MODEL HAVING  $45^\circ$  SWEEPBACK WING AND TAIL SURFACES. Jacob H. Lichtenstein. June 1951. 26p. diagrs., photo., 3 tabs. (NACA TN 2381)

## AERODYNAMICS 82 STABILITY AND CONTROL (1.8)

### *Longitudinal Dynamic Stability* (Cont.)

EFFECT OF HORIZONTAL-TAIL SIZE AND TAIL LENGTH ON LOW-SPEED STATIC LONGITUDINAL STABILITY AND DAMPING IN PITCH OF A MODEL HAVING 45° SWEEPBACK WING AND TAIL SURFACES. Jacob H. Lichtenstein. June 1951. 32p. diags., photo., 3 tabs. (NACA TN 2382)

THREE-DIMENSIONAL UNSTEADY LIFT PROBLEMS IN HIGH-SPEED FLIGHT - THE TRIANGULAR WING. Harvard Lomax, Max A. Heaslet and Franklyn B. Fuller. June 1951. 62p. diags. (NACA TN 2387)

THEORETICAL STUDY OF SOME METHODS FOR INCREASING THE SMOOTHNESS OF FLIGHT THROUGH ROUGH AIR. William H. Phillips and Christopher C. Kraft, Jr. July 1951. 96p. diags., 3 tabs. (NACA TN 2416)

FLIGHT INVESTIGATION OF A MECHANICAL FEEL DEVICE IN AN IRREVERSIBLE ELEVATOR CONTROL SYSTEM OF A LARGE AIRPLANE. B. Porter Brown, Robert G. Chilton and James B. Whitten. October 1951. 47p. diags., photos. (NACA TN 2496)

PITCHING-MOMENT DERIVATIVES  $C_{m_q}$  AND  $C_{m_{\dot{\alpha}}}$  AT SUPERSONIC SPEEDS FOR A SLENDER-DELTA-WING AND SLENDER-BODY COMBINATION AND APPROXIMATE SOLUTIONS FOR BROAD-DELTA-WING AND SLENDER-BODY COMBINATIONS. Arthur Henderson, Jr. December 1951. 29p. diags. (NACA TN 2553)

A FLIGHT INVESTIGATION OF THE EFFECT OF CENTER-OF-GRAVITY LOCATION ON GUST LOADS. Jack Funk and Earle T. Binckley. December 1951. 18p. diags., 3 tabs. (NACA TN 2575)

A COMPARISON OF PREDICTED AND EXPERIMENTALLY DETERMINED LONGITUDINAL DYNAMIC RESPONSES OF A STABILIZED AIRPLANE. Louis H. Smaus, Marvin R. Gore and Merle G. Waugh. December 1951. 53p. diags., photos. (NACA TN 2578)

MATRIX METHOD OF DETERMINING THE LONGITUDINAL-STABILITY COEFFICIENTS AND FREQUENCY RESPONSE OF AN AIRCRAFT FROM TRANSIENT FLIGHT DATA. James J. Donegan and Henry A. Pearson. 1952. ii, 11p. diags., 3 tabs. (NACA Rept. 1070. Formerly TN 2370)

EFFECTS ON LONGITUDINAL STABILITY AND CONTROL CHARACTERISTICS OF A BOEING B-29 AIRPLANE OF VARIATIONS IN STICK-FORCE AND CONTROL-RATE CHARACTERISTICS OBTAINED THROUGH USE OF A BOOSTER IN THE ELEVATOR-CONTROL SYSTEM. Charles W. Mathews, Donald B. Talmage and James B. Whitten. 1952. ii, 17p. diags., photo., tab. (NACA Rept. 1076. Formerly TN 2238; RM L50D11)

SINGLE-DEGREE-OF-FREEDOM-FLUTTER CALCULATIONS FOR A WING IN SUBSONIC POTENTIAL FLOW AND COMPARISON WITH AN EXPERIMENT. Harry L. Runyan. 1952. ii, 8p. diags. (NACA Rept. 1089. Formerly TN 2396)

SOME EFFECTS OF VARYING THE DAMPING IN PITCH AND ROLL ON THE FLYING QUALITIES OF A SMALL SINGLE-ROTOR HELICOPTER. John P. Reeder and James B. Whitten. January 1952. 23p. diags., photos., 4 tabs. (NACA TN 2459)

A DESCRIPTION AND A COMPARISON OF CERTAIN NONLINEAR CURVE-FITTING TECHNIQUES, WITH APPLICATIONS TO THE ANALYSIS OF TRANSIENT-RESPONSE DATA. Marvin Shinbrot. February 1952. 41p. diags., 5 tabs. (NACA TN 2622)

ESTIMATION OF THE MAXIMUM ANGLE OF SIDESLIP FOR DETERMINATION OF VERTICAL-TAIL LOADS IN ROLLING MANEUVERS. Ralph W. Stone, Jr. February 1952. 46p. diags., 4 tabs. (NACA TN 2633)

MEASUREMENTS OF FLYING QUALITIES OF AN F-47D-30 AIRPLANE TO DETERMINE LONGITUDINAL STABILITY AND CONTROL AND STALLING CHARACTERISTICS. Christopher C. Kraft, Jr., R. Fabian Goranson and John P. Reeder. February 1953. 75p. photos., diags., 2 tabs. (NACA TN 2899)

MATRIX METHODS FOR DETERMINING THE LONGITUDINAL-STABILITY DERIVATIVES OF AN AIRPLANE FROM TRANSIENT FLIGHT DATA. James J. Donegan. March 1953. 65p. diags., 6 tabs. (NACA TN 2902)

INVESTIGATION OF LATERAL CONTROL NEAR THE STALL. FLIGHT INVESTIGATION WITH A LIGHT HIGH-WING MONOPLANE TESTED WITH VARIOUS AMOUNTS OF WASHOUT AND VARIOUS LENGTHS OF LEADING-EDGE SLOT. Fred E. Weick, Maurice S. Sevelson, James G. McClure and Marion D. Flanagan, Agricultural and Mechanical College of Texas. May 1953. 61p. diags., photos., 4 tabs. (NACA TN 2948)

### Lateral and Directional (1.8.1.2.2)

PRELIMINARY INVESTIGATION AT LOW SPEEDS OF SWEEP WINGS IN ROLLING FLOW. David Feigenbaum and Alex Goodman. May 22, 1947. 29p. diags., photo. (NACA RM L7E09) (Reclassified from Restricted, 6/27/51)

MEASUREMENTS OF THE DAMPING IN ROLL OF LARGE-SCALE SWEEP-FORWARD AND SWEEP-BACK WINGS. Lynn W. Hunton and Joseph K. Dew. July 30, 1947. 39p. diags., photos., 2 tabs. (NACA RM A7D11) (Declassified from Restricted 6/5/53)

FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS. Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diags., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

WIND-TUNNEL INVESTIGATION OF THE STABILITY OF JETTISONED NOSE SECTIONS OF THE D-558 AIRPLANE - PHASES I AND II. Stanley H. Scher. January 14, 1948. 33p. photos., diags., 6 tabs. (NACA RM L7K10) (Declassified from Confidential, 9/16/52)

*Lateral and Directional Dynamic  
Stability (Cont.)*

**PRELIMINARY INVESTIGATION AT LOW SPEEDS OF SWEEP WINGS IN YAWING FLOW.** Alex Goodman and David Feigenbaum. February 4, 1948. 22p. diagrs., photo. (NACA RM L7109) (Reclassified from Restricted, 7/3/51)

**EFFECT OF AIRFOIL PROFILE OF SYMMETRICAL SECTIONS ON THE LOW-SPEED ROLLING DERIVATIVES OF 45° SWEEPBACK-WING MODELS OF ASPECT RATIO 2.61.** William Letko and Jack D. Brewer. March 4, 1949. 27p. diagrs., photo., 2 tabs. (NACA RM L8L31a) (Declassified from Restricted, 3/10/52)

**A THEORETICAL ANALYSIS OF THE EFFECT OF TIME LAG IN AN AUTOMATIC STABILIZATION SYSTEM ON THE LATERAL OSCILLATORY STABILITY OF AN AIRPLANE.** Leonard Sternfield and Ordway B. Gates, Jr. 1951. ii, 12p. diagrs. (NACA Rept. 1018. Formerly TN 2005)

**ANALYSIS OF MEANS OF IMPROVING THE UN-CONTROLLED LATERAL MOTIONS OF PERSONAL AIRPLANES.** Marion O. McKinney, Jr. 1951. ii, 9p. diagrs., 3 tabs. (NACA Rept. 1035. Formerly TN 1997)

**SOME EFFECTS OF NONLINEAR VARIATION IN THE DIRECTIONAL-STABILITY AND DAMPING-IN-YAWING DERIVATIVES ON THE LATERAL STABILITY OF AN AIRPLANE.** Leonard Sternfield. 1951. ii, 9p. diagrs., tab. (NACA Rept. 1042. Formerly TN 2233)

**SUMMARY OF METHODS FOR CALCULATING DYNAMIC LATERAL STABILITY AND RESPONSE AND FOR ESTIMATING LATERAL STABILITY DERIVATIVES.** John P. Campbell and Marion O. McKinney. July 1951. 97p. diagrs., 2 tabs. (NACA TN 2409)

**THEORETICAL FORCE AND MOMENTS DUE TO SIDESLIP OF A NUMBER OF VERTICAL TAIL CONFIGURATIONS AT SUPERSONIC SPEEDS.** John C. Martin and Frank S. Malvestuto, Jr. September 1951. 60p. diagrs., photos. (NACA TN 2412)

**EFFECT OF AN AUTOPILOT SENSITIVE TO YAWING VELOCITY ON THE LATERAL STABILITY OF A TYPICAL HIGH-SPEED AIRPLANE.** Ordway B. Gates, Jr. and Leonard Sternfield. September 1951. 29p. diagrs., 2 tabs. (NACA TN 2470)

**A THEORETICAL ANALYSIS OF THE EFFECT OF SEVERAL AUXILIARY DAMPING DEVICES ON THE LATERAL STABILITY AND CONTROLLABILITY OF A HIGH-SPEED AIRCRAFT.** Ordway B. Gates, Jr. December 1951. 39p. diagrs., 6 tabs. (NACA TN 2565)

**INFLUENCE OF WING AND FUSELAGE ON THE VERTICAL-TAIL CONTRIBUTION TO THE LOW-SPEED ROLLING DERIVATIVES OF MIDWING AIRPLANE MODELS WITH 45° SWEEPBACK SURFACES.** Walter D. Wolhart. December 1951. 55p. diagrs., photo., 3 tabs. (NACA TN 2587)

**ANALYSIS OF THE EFFECTS OF WING INTERFERENCE ON THE TAIL CONTRIBUTIONS TO THE ROLLING DERIVATIVES.** William H. Michael, Jr. 1952. ii, 12p. diagrs. (NACA Rept. 1086. Formerly TN 2332)

**SINGLE-DEGREE-OF-FREEDOM-FLUTTER CALCULATIONS FOR A WING IN SUBSONIC POTENTIAL FLOW AND COMPARISON WITH AN EXPERIMENT.** Harry L. Runyan. 1952. ii, 8p. diagrs. (NACA Rept. 1089. Formerly TN 2396)

**ESTIMATION OF THE MAXIMUM ANGLE OF SIDESLIP FOR DETERMINATION OF VERTICAL-TAIL LOADS IN ROLLING MANEUVERS.** Ralph W. Stone, Jr. February 1952. 46p. diagrs., 4 tabs. (NACA TN 2633)

**CALCULATION OF THE LATERAL-DYNAMIC STABILITY OF AIRCRAFT.** (Raschet Bokovoi Dinamicheskoi Ustoichivosti Samolets). A. Raikh. February 1952. 82p. diagrs., 4 tabs. (NACA TM 1264. Trans. from Central Aero-Hydrodynamical Institute, Transactions, No. 453, 1939).

**SOME EFFECTS OF FREQUENCY ON THE CONTRIBUTION OF A VERTICAL TAIL TO THE FREE AERODYNAMIC DAMPING OF A MODEL OSCILLATING IN YAW.** John D. Bird, Lewis R. Fisher and Sadie M. Hubbard. April 1952. 39p. diagrs., photo., tab. (NACA TN 2657)

**EFFECT OF LINEAR SPANWISE VARIATIONS OF TWIST AND CIRCULAR-ARC CAMBER ON LOW-SPEED STATIC STABILITY, ROLLING, AND YAWING CHARACTERISTICS OF A 45° SWEEPBACK WING OF ASPECT RATIO 4 AND TAPER RATIO 0.6.** Byron M. Jaquet. August 1952. 27p. diagrs., 2 tabs. (NACA TN 2775)

**SOME EFFECTS OF AMPLITUDE AND FREQUENCY ON THE AERODYNAMIC DAMPING OF A MODEL OSCILLATING CONTINUOUSLY IN YAW.** Lewis R. Fisher and Walter D. Wolhart. September 1952. 24p. diagrs., photo. (NACA TN 2766)

**THE EFFECTS OF DYNAMIC LATERAL STABILITY AND CONTROL OF LARGE ARTIFICIAL VARIATIONS IN THE ROTARY STABILITY DERIVATIVES.** Robert O. Schade and James L. Hassell, Jr. October 1952. 56p. diagrs., photo., 2 tabs. (NACA TN 2781)

**INVESTIGATION OF LATERAL CONTROL NEAR THE STALL. FLIGHT INVESTIGATION WITH A LIGHT HIGH-WING MONOPLANE TESTED WITH VARIOUS AMOUNTS OF WASHOUT AND VARIOUS LENGTHS OF LEADING-EDGE SLOT.** Fred E. Weick, Maurice S. Sevelson, James G. McClure and Marion D. Flanagan, Agricultural and Mechanical College of Texas. May 1953. 61p. diagrs., photos., 4 tabs. (NACA TN 2948)

## AERODYNAMICS

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#### Damping Derivatives (1.8.1.2.3)

PRELIMINARY INVESTIGATION AT LOW SPEEDS OF SWEEP WINGS IN ROLLING FLOW. David Feigenbaum and Alex Goodman. May 22, 1947. 29p. diagrs., photo. (NACA RM L7E09) (Reclassified from Restricted, 6/27/51)

MEASUREMENTS OF THE DAMPING IN ROLL OF LARGE-SCALE SWEEP-FORWARD AND SWEEP-BACK WINGS. Lynn W. Hunton and Joseph K. Dew. July 30, 1947. 39p. diagrs., photos., 2 tabs. (NACA RM A7D11) (Declassified from Restricted 6/5/53)

FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS. Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diagrs., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

PRELIMINARY INVESTIGATION AT LOW SPEEDS OF SWEEP WINGS IN YAWING FLOW. Alex Goodman and David Feigenbaum. February 4, 1948. 22p. diagrs., photo. (NACA RM L7I09) (Reclassified from Restricted, 7/3/51)

WIND-TUNNEL INVESTIGATION AT LOW SPEEDS OF THE PITCHING DERIVATIVES OF UNTAPERED SWEEP WINGS. Robert MacLachlan and Lewis R. Fisher. September 29, 1948. 22p. diagrs., photo., tab. (NACA RM L8G19) (Declassified from Restricted, 3/10/52)

EFFECT OF AIRFOIL PROFILE OF SYMMETRICAL SECTIONS ON THE LOW-SPEED STATIC-STABILITY AND YAWING DERIVATIVES OF 45° SWEEPBACK WING MODELS OF ASPECT RATIO 2.61. William Letko and Byron M. Jaquet. November 9, 1948. 21p. diagrs., photo., tab. (NACA RM L8H10) (Declassified from Restricted, 3/10/52)

EFFECT OF AIRFOIL PROFILE OF SYMMETRICAL SECTIONS ON THE LOW-SPEED ROLLING DERIVATIVES OF 45° SWEEPBACK-WING MODELS OF ASPECT RATIO 2.61. William Letko and Jack D. Brewer. March 4, 1949. 27p. diagrs., photo., 2 tabs. (NACA RM L8L31a) (Declassified from Restricted, 3/10/52)

CALCULATION OF THE AERODYNAMIC LOADING OF SWEEP AND UNSWEEP FLEXIBLE WINGS OF ARBITRARY STIFFNESS. Franklin W. Diederich. 1950. ii, 29p. diagrs., 10 tabs. (NACA Rept. 1000. Formerly RM L8G27a, TN 1876)

A STUDY OF THE USE OF EXPERIMENTAL STABILITY DERIVATIVES IN THE CALCULATION OF THE LATERAL DISTURBED MOTIONS OF A SWEEP-WING AIRPLANE AND COMPARISON WITH FLIGHT RESULTS. John D. Bird and Byron M. Jaquet. 1951. ii, 25p. diagrs., photos., 4 tabs. (NACA Rept. 1031. Formerly TN 2013)

SOME EFFECTS OF NONLINEAR VARIATION IN THE DIRECTIONAL-STABILITY AND DAMPING-IN-YAWING DERIVATIVES ON THE LATERAL STABILITY OF AN AIRPLANE. Leonard Sternfield. 1951. ii, 9p. diagrs., tab. (NACA Rept. 1042. Formerly TN 2233)

A SUMMARY OF LATERAL-STABILITY DERIVATIVES CALCULATED FOR WING PLAN FORMS IN SUPERSONIC FLOW. Arthur L. Jones and Alberta Alksne. 1951. ii, 35p. diagrs., 3 tabs. (NACA Rept. 1052)

EFFECT OF HORIZONTAL-TAIL LOCATION ON LOW-SPEED STATIC LONGITUDINAL STABILITY AND DAMPING IN PITCH OF A MODEL HAVING 45° SWEEPBACK WING AND TAIL SURFACES. Jacob H. Lichtenstein. June 1951. 26p. diagrs., photo., 3 tabs. (NACA TN 2381)

EFFECT OF HORIZONTAL-TAIL SIZE AND TAIL LENGTH ON LOW-SPEED STATIC LONGITUDINAL STABILITY AND DAMPING IN PITCH OF A MODEL HAVING 45° SWEEPBACK WING AND TAIL SURFACES. Jacob H. Lichtenstein. June 1951. 32p. diagrs., photo., 3 tabs. (NACA TN 2382)

THREE-DIMENSIONAL UNSTEADY LIFT PROBLEMS IN HIGH-SPEED FLIGHT - THE TRIANGULAR WING. Harvard Lomax, Max A. Heaslet and Franklyn B. Fuller. June 1951. 62p. diagrs. (NACA TN 2387)

SUMMARY OF METHODS FOR CALCULATING DYNAMIC LATERAL STABILITY AND RESPONSE AND FOR ESTIMATING LATERAL STABILITY DERIVATIVES. John P. Campbell and Marion O. McKinney. July 1951. 97p. diagrs., 2 tabs. (NACA TN 2409)

EFFECT OF FUSELAGE AND TAIL SURFACES ON LOW-SPEED YAWING CHARACTERISTICS OF A SWEEP-WING MODEL AS DETERMINED IN CURVED-FLOW TEST SECTION OF LANGLEY STABILITY TUNNEL. John D. Bird, Byron M. Jaquet and John W. Cowan. October 1951. 19p. diagrs., photo. (NACA TN 2483. Formerly RM L8G13)

EXPERIMENTAL INVESTIGATION OF THE LOW-SPEED STATIC AND YAWING STABILITY CHARACTERISTICS OF A 45° SWEEPBACK HIGH-WING CONFIGURATION WITH VARIOUS TWIN VERTICAL WING FINNS. Alex Goodman and Walter D. Wolhart. November 1951. 25p. diagrs., photos., 3 tabs. (NACA TN 2534)

EFFECT OF TAPER RATIO ON THE LOW-SPEED ROLLING STABILITY DERIVATIVES OF SWEEP AND UNSWEEP WINGS OF ASPECT RATIO 2.61. Jack D. Brewer and Lewis R. Fisher. November 1951. 17p. diagrs., photo. (NACA TN 2555. Formerly RM L8H18)

PITCHING-MOMENT DERIVATIVES  $C_{m\dot{\alpha}}$  AND  $C_{m\ddot{\alpha}}$  AT SUPERSONIC SPEEDS FOR A SLENDER-DELTA-WING AND SLENDER-BODY COMBINATION AND APPROXIMATE SOLUTIONS FOR BROAD-DELTA-WING AND SLENDER-BODY COMBINATIONS. Arthur Henderson, Jr. December 1951. 29p. diagrs. (NACA TN 2553)

EXPERIMENTAL INVESTIGATION OF ROLLING PERFORMANCE OF STRAIGHT AND SWEEPBACK FLEXIBLE WINGS WITH VARIOUSAILERONS. Henry A. Cole, Jr. and Victor M. Ganzer, University of Washington. December 1951. 45p. diagrs., photos., 2 tabs. (NACA TN 2563)

*Damping Derivatives - Stability*  
(Cont.)

INFLUENCE OF WING AND FUSELAGE ON THE VERTICAL-TAIL CONTRIBUTION TO THE LOW-SPEED ROLLING DERIVATIVES OF MIDWING AIRPLANE MODELS WITH 45° SWEEPBACK SURFACES. Walter D. Wolhart. December 1951. 55p. diags., photo., 3 tabs. (NACA TN 2587)

MATRIX METHOD OF DETERMINING THE LONGITUDINAL-STABILITY COEFFICIENTS AND FREQUENCY RESPONSE OF AN AIRCRAFT FROM TRANSIENT FLIGHT DATA. James J. Donegan and Henry A. Pearson. 1952. ii, 11p. diags., 3 tabs. (NACA Rept. 1070. Formerly TN 2370)

ANALYSIS OF THE EFFECTS OF WING INTERFERENCE ON THE TAIL CONTRIBUTIONS TO THE ROLLING DERIVATIVES. William H. Michael, Jr. 1952. ii, 12p. diags. (NACA Rept. 1086. Formerly TN 2332)

THEORETICAL DAMPING IN ROLL AND ROLLING MOMENT DUE TO DIFFERENTIAL WING INCIDENCE FOR SLENDER CRUCIFORM WINGS AND WING-BODY COMBINATIONS. Gaynor J. Adams and Duane W. Dugan. 1952. ii, 11p. diags. (NACA Rept. 1088. Extends analysis of TN 2270)

A DESCRIPTION AND A COMPARISON OF CERTAIN NONLINEAR CURVE-FITTING TECHNIQUES, WITH APPLICATIONS TO THE ANALYSIS OF TRANSIENT-RESPONSE DATA. Marvin Shinbrot. February 1952. 41p. diags., 5 tabs. (NACA TN 2622)

SOME EFFECTS OF FREQUENCY ON THE CONTRIBUTION OF A VERTICAL TAIL TO THE FREE AERODYNAMIC DAMPING OF A MODEL OSCILLATING IN YAW. John D. Bird, Lewis R. Fisher and Sadie M. Hubbard. April 1952. 39p. diags., photo., tab. (NACA TN 2657)

EFFECT OF HIGH-LIFT DEVICES ON THE LOW-SPEED STATIC LATERAL AND YAWING STABILITY CHARACTERISTICS OF AN UNTAPERED 45° SWEEPBACK WING. Jacob H. Lichtenstein. May 1952. 20p. diags., photo. (NACA TN 2689. Formerly RM L8G20)

A VECTOR STUDY OF LINEARIZED SUPERSONIC FLOW APPLICATIONS TO NONPLANAR PROBLEMS. John C. Martin. June 1952. 81p. diags., tab. (NACA TN 2641)

CALCULATION OF LIFT AND PITCHING MOMENTS DUE TO ANGLE OF ATTACK AND STEADY PITCHING VELOCITY AT SUPERSONIC SPEEDS FOR THIN SWEEPBACK TAPERED WINGS WITH STREAMWISE TIPS AND SUPERSONIC LEADING AND TRAILING EDGES. John C. Martin, Kenneth Margolis and Isabella Jeffreys. June 1952. 116p. diags., 9 tabs. (NACA TN 2699)

INVESTIGATION OF THE INFLUENCE OF FUSELAGE AND TAIL SURFACES ON LOW-SPEED STATIC STABILITY AND ROLLING CHARACTERISTICS OF A SWEEP-WING MODEL. John D. Bird, Jacob H. Lichtenstein and Byron M. Jaquet. July 1952. 18p. diags., photo. (NACA TN 2741. Formerly RM L7H15)

EFFECT OF LINEAR SPANWISE VARIATIONS OF TWIST AND CIRCULAR-ARC CAMBER ON LOW-SPEED STATIC STABILITY, ROLLING, AND YAWING CHARACTERISTICS OF A 45° SWEEPBACK WING OF ASPECT RATIO 4 AND TAPER RATIO 0.6. Byron M. Jaquet. August 1952. 27p. diags., 2 tabs. (NACA TN 2775)

SOME EFFECTS OF AMPLITUDE AND FREQUENCY ON THE AERODYNAMIC DAMPING OF A MODEL OSCILLATING CONTINUOUSLY IN YAW. Lewis R. Fisher and Walter D. Wolhart. September 1952. 24p. diags., photo. (NACA TN 2766)

THE EFFECTS OF DYNAMIC LATERAL STABILITY AND CONTROL OF LARGE ARTIFICIAL VARIATIONS IN THE ROTARY STABILITY DERIVATIVES. Robert O. Schade and James L. Hassell, Jr. October 1952. 56p. diags., photo., 2 tabs. (NACA TN 2781)

METHOD FOR CALCULATING THE ROLLING AND YAWING MOMENTS DUE TO ROLLING FOR UNSWEPT WINGS WITH OR WITHOUT FLAPS OR ALERONS BY USE OF NONLINEAR SECTION LIFT DATA. Albert P. Martina. May 1953. 41p. diags., 11 tabs. (NACA TN 2937)

## CONTROL (1.8.2)

### LONGITUDINAL CONTROL (1.8.2.1)

INVESTIGATION AT HIGH SPEEDS OF A HORIZONTAL-TAIL MODEL IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Ralph P. Bielat. January 31, 1947. 102p. diags., 3 tabs. (NACA RM L6L10b) (Declassified from Restricted, 6/5/53)

LONGITUDINAL STABILITY AND CONTROL OF HIGH-SPEED AIRPLANES WITH PARTICULAR REFERENCE TO DIVE RECOVERY. John A. Axelsson. September 4, 1947. 25p. diags. (NACA RM A7C24) (Reclassified from Restricted, 6/27/51)

WING-FLOW TESTS OF A TRIANGULAR WING OF ASPECT RATIO TWO. I. EFFECTIVENESS OF SEVERAL TYPES OF TRAILING-EDGE FLAPS ON FLAT-PLATE MODELS. George A. Rathert, Jr. and George E. Cooper. November 14, 1947. 61p. diags., photos. (NACA RM A7G18) (Declassified from Confidential, 6/5/53)

FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS. Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diags., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

LOW-SPEED INVESTIGATION OF A SMALL TRIANGULAR WING OF ASPECT RATIO 2.0. II - FLAPS. Leonard M. Rose. August 9, 1948. 17p. diags., photo. (NACA RM A7L11) (Declassified from Restricted, 6/11/53)

**AERODYNAMICS**  
**86 STABILITY AND CONTROL (1.8)**

*Longitudinal Control (Cont.)*

**RATIO 2 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - THE EFFECTIVENESS AND HINGE MOMENTS OF A CONSTANT-CHORD PLAIN FLAP.** Jack D. Stephenson and Arthur R. Amuendo. September 21, 1948. 82p. diagrs., photos., 9 tabs. (NACA RM A8E03) (Declassified from Restricted, 6/11/53)

**TESTS OF A MODEL HORIZONTAL TAIL OF ASPECT RATIO 4.5 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. I - QUARTER-CHORD LINE SWEEP BACK 35°.** Bruce E. Tinling and Jerald K. Dickson. September 9, 1949. 118p. diagrs., photo., tab. (NACA RM A9G13) (Declassified from Restricted, 6/11/53)

**TESTS OF A MODEL HORIZONTAL TAIL OF ASPECT RATIO 4.5 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - ELEVATOR HINGE LINE NORMAL TO THE PLANE OF SYMMETRY.** Bruce E. Tinling and Jerald K. Dickson. October 17, 1949. 106p. diagrs., photo., tabs. (NACA RM A9H11a) (Declassified from Restricted, 6/11/53)

**FLIGHT INVESTIGATION OF SOME FACTORS AFFECTING THE CRITICAL TAIL LOADS ON LARGE AIRPLANES.** Harvey H. Brown. September 1951. 119p. diagrs., photos., 2 tabs. (NACA TN 2490)

**THEORETICAL CHARACTERISTICS OF TWO-DIMENSIONAL SUPERSONIC CONTROL SURFACES.** Robert R. Morrisette and Lester F. Oborny. October 1951. 74p. diagrs., tab. (NACA TN 2486. Formerly RM L8G12)

**FLIGHT INVESTIGATION OF A MECHANICAL FEEL DEVICE IN AN IRREVERSIBLE ELEVATOR CONTROL SYSTEM OF A LARGE AIRPLANE.** B. Porter Brown, Robert G. Chilton and James B. Whitten. October 1951. 47p. diagrs., photos. (NACA TN 2496)

**THEORETICAL ANALYSIS OF SOME SIMPLE TYPES OF ACCELERATION RESTRICTORS.** William H. Phillips. December 1951. 35p. diagrs., 2 tabs. (NACA TN 2574)

**EFFECTS ON LONGITUDINAL STABILITY AND CONTROL CHARACTERISTICS OF A BOEING B-29 AIRPLANE OF VARIATIONS IN STICK-FORCE AND CONTROL-RATE CHARACTERISTICS OBTAINED THROUGH USE OF A BOOSTER IN THE ELEVATOR-CONTROL SYSTEM.** Charles W. Mathews, Donald B. Talmage and James B. Whitten. 1952. ii, 17p. diagrs., photo., tab. (NACA Rept. 1076. Formerly TN 2238; RM L50D11)

**THEORETICAL INVESTIGATION OF THE LONGITUDINAL RESPONSE CHARACTERISTICS OF A SWEEP-WING FIGHTER AIRPLANE HAVING A PITCH-ATTITUDE CONTROL SYSTEM.** Fred H. Stokes and J. T. Matthews. January 1953. 41p. diagrs., tab. (NACA TN 2882)

**LANGLEY FULL-SCALE-TUNNEL TESTS OF THE CUSTER CHANNEL WING AIRPLANE.** Jerome Pasamanick. April 1953. 57p. diagrs., photos., tab. (NACA RM L53A09)

**INVESTIGATION OF LATERAL CONTROL NEAR THE STALL. FLIGHT INVESTIGATION WITH A LIGHT HIGH-WING MONOPLANE TESTED WITH VARIOUS AMOUNTS OF WASHOUT AND VARIOUS LENGTHS OF LEADING-EDGE SLOT.** Fred E. Weick, Maurice S. Sevelson, James G. McClure and Marion D. Flanagan, Agricultural and Mechanical College of Texas. May 1953. 61p. diagrs., photos., 4 tabs. (NACA TN 2948)

**LATERAL CONTROL**  
**(1.8.2.2)**

**AN INVESTIGATION OF A HIGH-ASPECT-RATIO WING HAVING 0.20-CHORD PLAIN AILERONS IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL.** Arvo A. Luoma. August 28, 1946. 124p. diagrs., photos., 2 tabs. (NACA RM L6H28d) (Declassified from Restricted, 6/5/53)

**AN INVESTIGATION OF THE HINGE-MOMENT FLUCTUATIONS OF 0.20-CHORD PLAIN AILERONS ON A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL.** Arvo A. Luoma and Luke L. Liccini. January 10, 1947. 9p. diagrs. (NACA RM L6L10a) (Declassified from Restricted, 6/5/53)

**FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS.** Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diagrs., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

**CALCULATION OF THE LATERAL CONTROL OF SWEEP AND UNSWEEP FLEXIBLE WINGS OF ARBITRARY STIFFNESS.** Franklin W. Diederich. 1951. ii, 19p. diagrs., 6 tabs. (NACA Rept. 1024. Formerly RM L8H24a)

**A STUDY OF THE USE OF EXPERIMENTAL STABILITY DERIVATIVES IN THE CALCULATION OF THE LATERAL DISTURBED MOTIONS OF A SWEEP-WING AIRPLANE AND COMPARISON WITH FLIGHT RESULTS.** John D. Bird and Byron M. Jaquet. 1951. ii, 25p. diagrs., photos., 4 tabs. (NACA Rept. 1031. Formerly TN 2013)

**INVESTIGATION OF SPOILER AILERONS FOR USE AS SPEED BRAKES OR GLIDE-PATH CONTROLS ON TWO NACA 65-SERIES WINGS EQUIPPED WITH FULL-SPAN SLOTTED FLAPS.** Jack Fischel and James M. Watson. 1951. ii, 25p. diagrs. (NACA Rept. 1034. Formerly TN 1933)

**THEORETICAL ANTISYMMETRIC SPAN LOADING FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS.** John DeYoung. 1951. 36p. diagrs., 9 tabs. (NACA Rept. 1056. Formerly TN 2140)

**LATERAL CONTROL BY SPOILERS AT THE DVL. (DVL - Unterbrecherquersteuerung).** M. Kramer, Th. Zobel and C. G. Esche. I. SYSTEMATIC WIND-TUNNEL TESTS CONCERNING THE PROBLEM OF LATERAL CONTROL BY SPOILERS PERMEABLE TO AIR. M. Kramer and Th. Zobel. II. CONTRIBUTION TO THE LATERAL CONTROL BY SPOILERS AT THE DVL. M. Kramer. III. FLIGHT TESTS IN THE LATERAL CONTROLS BY SPOILERS ON THE AIRPLANE MODEL FIESELER FI 156. C. G. Esche. August 1951. 82p. diagrs., photo., tab. (NACA TM 1307. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 964).

*Lateral Control (Cont.)*

AN ANALYTICAL INVESTIGATION OF EFFECT OF HIGH-LIFT FLAPS ON TAKE-OFF OF LIGHT AIRPLANES. Fred E. Weick, L. E. Flanagan, Jr., and H. H. Cherry, Agricultural and Mechanical College of Texas. September 1951. 101p. diagrs., 3 tabs. (NACA TN 2404)

FLIGHT INVESTIGATION OF SOME FACTORS AFFECTING THE CRITICAL TAIL LOADS ON LARGE AIRPLANES. Harvey H. Brown. September 1951. 119p. diagrs., photos., 2 tabs. (NACA TN 2490)

THEORETICAL CHARACTERISTICS OF TWO-DIMENSIONAL SUPERSONIC CONTROL SURFACES. Robert R. Morrisette and Lester F. Oborny. October 1951. 74p. diagrs., tab. (NACA TN 2486. Formerly RM L8G12)

STABILITY AND CONTROL CHARACTERISTICS OF A COMPLETE AIRPLANE MODEL HAVING A WING WITH QUARTER-CHORD LINE SWEEP BACK 40°, ASPECT RATIO 2.50, AND TAPER RATIO 0.42. Marvin Schulderfrei, Paul Comisarow and Kenneth W. Goodson. December 1951. 86p. photos., diagrs. (NACA TN 2482. Formerly RM L7B25)

EXPERIMENTAL INVESTIGATION OF ROLLING PERFORMANCE OF STRAIGHT AND SWEEPBACK FLEXIBLE WINGS WITH VARIOUS AILERONS. Henry A. Cole, Jr. and Victor M. Ganzer, University of Washington. December 1951. 45p. diagrs., photos., 2 tabs. (NACA TN 2563)

THEORETICAL DAMPING IN ROLL AND ROLLING MOMENT DUE TO DIFFERENTIAL WING INCIDENCE FOR SLENDER CRUCIFORM WINGS AND WING-BODY COMBINATIONS. Gaynor J. Adams and Duane W. Dugan. 1952. ii, 11p. diagrs. (NACA Rept. 1088. Extends analysis of TN 2270)

FLIGHT INVESTIGATION OF THE EFFECT OF CONTROL CENTERING SPRINGS ON THE APPARENT SPIRAL STABILITY OF A PERSONAL-OWNER AIRPLANE. John P. Campbell, Paul A. Hunter, Donald E. Hewes and James B. Whitten. 1952. ii, 17p. diagrs., photo., 2 tabs. (NACA Rept. 1092. Formerly TN 2413)

SOME EFFECTS OF VARYING THE DAMPING IN PITCH AND ROLL ON THE FLYING QUALITIES OF A SMALL SINGLE-ROTOR HELICOPTER. John P. Reeder and James B. Whitten. January 1952. 23p. diagrs., photos., 4 tabs. (NACA TN 2459)

ESTIMATION OF THE MAXIMUM ANGLE OF SIDE-SLIP FOR DETERMINATION OF VERTICAL-TAIL LOADS IN ROLLING MANEUVERS. Ralph W. Stone, Jr. February 1952. 46p. diagrs., 4 tabs. (NACA TN 2633)

CHARTS AND APPROXIMATE FORMULAS FOR THE ESTIMATION OF AEROELASTIC EFFECTS ON THE LATERAL CONTROL OF SWEEPED AND UNSWEEPED WINGS. Kenneth A. Foss and Franklin W. Diederich. July 1952. 70p. diagrs., 2 tabs. (NACA TN 2747)

THE EFFECTS OF DYNAMIC LATERAL STABILITY AND CONTROL OF LARGE ARTIFICIAL VARIATIONS IN THE ROTARY STABILITY DERIVATIVES. Robert O. Schade and James L. Hassell, Jr. October 1952. 56p. diagrs., photo., 2 tabs. (NACA TN 2781)

METHOD FOR CALCULATING THE ROLLING AND YAWING MOMENTS DUE TO ROLLING FOR UNSWEEPED WINGS WITH OR WITHOUT FLAPS OR AILERONS BY USE OF NONLINEAR SECTION LIFT DATA. Albert P. Martina. May 1953. 41p. diagrs., 11 tabs. (NACA TN 2937)

INVESTIGATION OF LATERAL CONTROL NEAR THE STALL. FLIGHT INVESTIGATION WITH A LIGHT HIGH-WING MONOPLANE TESTED WITH VARIOUS AMOUNTS OF WASHOUT AND VARIOUS LENGTHS OF LEADING-EDGE SLOT. Fred E. Weick, Maurice S. Sevelson, James G. McClure and Marion D. Flanagan, Agricultural and Mechanical College of Texas. May 1953. 61p. diagrs., photos., 4 tabs. (NACA TN 2948)

### DIRECTIONAL CONTROL (1.8.2.3)

A STUDY OF THE USE OF EXPERIMENTAL STABILITY DERIVATIVES IN THE CALCULATION OF THE LATERAL DISTURBED MOTIONS OF A SWEEPED WING AIRPLANE AND COMPARISON WITH FLIGHT RESULTS. John D. Bird and Byron M. Jaquet. 1951. ii, 25p. diagrs., photos., 4 tabs. (NACA Rept. 1031. Formerly TN 2013)

BENCH-TEST INVESTIGATION OF THE TRANSIENT-RESPONSE CHARACTERISTICS OF SEVERAL SIMULATED AIRPLANES INCORPORATING AN AUTOPILOT SENSITIVE TO YAWING ACCELERATIONS. Donald A. Howard. July 1951. 27p. diagrs., photos., 2 tabs. (NACA TN 2395)

FLIGHT INVESTIGATION OF SOME FACTORS AFFECTING THE CRITICAL TAIL LOADS ON LARGE AIRPLANES. Harvey H. Brown. September 1951. 119p. diagrs., photos., 2 tabs. (NACA TN 2490)

FLIGHT INVESTIGATION OF THE EFFECT OF CONTROL CENTERING SPRINGS ON THE APPARENT SPIRAL STABILITY OF A PERSONAL-OWNER AIRPLANE. John P. Campbell, Paul A. Hunter, Donald E. Hewes and James B. Whitten. 1952. ii, 17p. diagrs., photo., 2 tabs. (NACA Rept. 1092. Formerly TN 2413)

THE EFFECTS OF DYNAMIC LATERAL STABILITY AND CONTROL OF LARGE ARTIFICIAL VARIATIONS IN THE ROTARY STABILITY DERIVATIVES. Robert O. Schade and James L. Hassell, Jr. October 1952. 56p. diagrs., photo., 2 tabs. (NACA TN 2781)

LANGLEY FULL-SCALE-TUNNEL TESTS OF THE CUSTER CHANNEL WING AIRPLANE. Jerome Pasamanick. April 1953. 57p. diagrs., photos., tab. (NACA RM L53A09)

### AIR BRAKES (1.8.2.4)

INVESTIGATION OF DIVE BRAKES AND A DIVE-RECOVERY FLAP ON A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Axel T. Mattson. August 28, 1946. 118p. diagrs., photos., tab. (NACA RM L6H28c) (Declassified from Restricted, 6/5/53)



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*Air Brakes (Cont.)*

INVESTIGATION OF SPOILER AILERONS FOR USE AS SPEED BRAKES OR GLIDE-PATH CONTROLS ON TWO NACA 65-SERIES WINGS EQUIPPED WITH FULL-SPAN SLOTTED FLAPS. Jack Fischel and James M. Watson. 1951. ii, 25p. diagrs. (NACA Rept. 1034. Formerly TN 1933)

HINGE MOMENTS  
(1.8.2.5)

AN INVESTIGATION OF A HIGH-ASPECT-RATIO WING HAVING 0.20-CHORD PLAIN AILERONS IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Arvo A. Luoma. August 28, 1946. 124p. diagrs., photos., 2 tabs. (NACA RM L6H28d) (Declassified from Restricted, 6/5/53)

AN INVESTIGATION OF THE HINGE-MOMENT FLUCTUATIONS OF 0.20-CHORD PLAIN AILERONS ON A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Arvo A. Luoma and Luke L. Liccini. January 10, 1947. 9p. diagrs. (NACA RM L6L10a) (Declassified from Restricted, 6/5/53)

INVESTIGATION AT HIGH SPEEDS OF A HORIZONTAL-TAIL MODEL IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Ralph P. Bielat. January 31, 1947. 102p. diagrs., 3 tabs. (NACA RM L6L10b) (Declassified from Restricted, 6/5/53)

LONGITUDINAL STABILITY AND CONTROL OF HIGH-SPEED AIRPLANES WITH PARTICULAR REFERENCE TO DIVE RECOVERY. John A. Axelson. September 4, 1947. 25p. diagrs. (NACA RM A7C24) (Reclassified from Restricted, 6/27/51)

TESTS OF A MODEL HORIZONTAL TAIL OF ASPECT RATIO 4.5 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. I - QUARTER-CHORD LINE SWEEP BACK 35°. Bruce E. Tinling and Jerald K. Dickson. September 9, 1949. 118p. diagrs., photo., tab. (NACA RM A9G13) (Declassified from Restricted, 6/11/53)

TESTS OF A MODEL HORIZONTAL TAIL OF ASPECT RATIO 4.5 IN THE AMES 12-FOOT PRESSURE WIND TUNNEL. II - ELEVATOR HINGE LINE NORMAL TO THE PLANE OF SYMMETRY. Bruce E. Tinling and Jerald K. Dickson. October 17, 1949. 106p. diagrs., photo., tabs. (NACA RM A9H11a) (Declassified from Restricted, 6/11/53)

THEORETICAL CHARACTERISTICS OF TWO-DIMENSIONAL SUPERSONIC CONTROL SURFACES. Robert R. Morrisette and Lester F. Oborny. October 1951. 74p. diagrs., tab. (NACA TN 2486. Formerly RM L8G12)

MEASUREMENTS OF FLYING QUALITIES OF AN F-47D-30 AIRPLANE TO DETERMINE LATERAL AND DIRECTIONAL STABILITY AND CONTROL CHARACTERISTICS. R. Fabian Goranson and Christopher C. Kraft, Jr. July 1952. 61p. diagrs., photos., 2 tabs. (NACA TN 2675)

AUTOMATIC CONTROL  
(1.8.2.6)

BENCH-TEST INVESTIGATION OF THE TRANSIENT-RESPONSE CHARACTERISTICS OF SEVERAL SIMULATED AIRPLANES INCORPORATING AN AUTOPILOT SENSITIVE TO YAWING ACCELERATIONS. Donald A. Howard. July 1951. 27p. diagrs., photos., 2 tabs. (NACA TN 2395)

A GRAPHICAL METHOD FOR PLOTTING AMPLITUDE AND PHASE ANGLE OF TRANSFER FUNCTIONS OF DYNAMIC SYSTEMS WITHOUT FACTORING POLYNOMIALS. Earl F. Smith. November 1951. 35p. diagrs., 4 tabs. (NACA TN 2522)

A COMPARISON OF PREDICTED AND EXPERIMENTALLY DETERMINED LONGITUDINAL DYNAMIC RESPONSES OF A STABILIZED AIRPLANE. Louis H. Smaus, Marvin R. Gore and Merle G. Waugh. December 1951. 53p. diagrs., photos. (NACA TN 2578)

AUTOMATIC CONTROL SYSTEMS SATISFYING CERTAIN GENERAL CRITERIONS ON TRANSIENT BEHAVIOR. Aaron S. Boksenbom and Richard Hood. 1952. ii, 13p. diagrs. (NACA Rep. 1068. Formerly TN 2378)

ANALOGUE-COMPUTER SIMULATION OF AN AUTOPILOT SERVO SYSTEM HAVING NONLINEAR RESPONSE CHARACTERISTICS. Arthur L. Jones and John S. White. June 1952. 30p. diagrs. (NACA TN 2707)

A THEORETICAL METHOD OF ANALYZING THE EFFECTS OF YAW-DAMPER DYNAMICS ON THE STABILITY OF AN AIRCRAFT EQUIPPED WITH A SECOND-ORDER YAW DAMPER. Albert A. Schy and Ordway B. Gates, Jr. December 1952. 72p. diagrs., 2 tabs. (NACA TN 2857)

THEORETICAL INVESTIGATION OF THE LONGITUDINAL RESPONSE CHARACTERISTICS OF A SWEEP-WING FIGHTER AIRPLANE HAVING A PITCH-ATTITUDE CONTROL SYSTEM. Fred H. Stokes and J. T. Matthews. January 1953. 41p. diagrs., tab. (NACA TN 2882)

SPINNING  
(1.8.3)

METHOD OF ESTIMATING THE MINIMUM SIZE OF A TAIL OR WING-TIP PARACHUTE FOR EMERGENCY SPIN RECOVERY OF AN AIRPLANE. Frank S. Malvestuto, Jr. October 27, 1948. 42p. diagrs., photos., 4 tabs. (NACA RM L8D27) (Reclassified from Confidential, 7/3/51)

PILOT ESCAPE FROM SPINNING AIRPLANES AS DETERMINED FROM FREE-SPINNING-TUNNEL TESTS. Stanley H. Scher. October 1951. 36p. diagrs., photos., 4 tabs. (NACA TN 2485. Formerly RM L8D28)

STUDY OF MOTION OF MODEL OF PERSONAL-OWNER OR LIAISON AIRPLANE THROUGH THE STALL AND INTO THE INCIPIENT SPIN BY MEANS OF A FREE-FLIGHT TESTING TECHNIQUE. Ralph W. Stone, Jr., William G. Garner and Lawrence J. Gale. April 1953. 28p. diagrs., photos., tab. (NACA TN 2923)

*Spinning (Cont.)*

INVESTIGATION OF LATERAL CONTROL NEAR THE STALL. FLIGHT INVESTIGATION WITH A LIGHT HIGH-WING MONOPLANE TESTED WITH VARIOUS AMOUNTS OF WASHOUT AND VARIOUS LENGTHS OF LEADING-EDGE SLOT. Fred E. Weick, Maurice S. Sevelson, James G. McClure and Marion D. Flanagan, Agricultural and Mechanical College of Texas. May 1953. 61p. diags., photos., 4 tabs. (NACA TN 2948)

## STALLING (1.8.4)

FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS. Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diags., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

WIND-TUNNEL INVESTIGATION OF HIGH-LIFT AND STALL-CONTROL DEVICES ON A 37° SWEEPED WING OF ASPECT RATIO 6 AT HIGH REYNOLDS NUMBERS. William Koven and Robert R. Graham. September 2, 1948. 70p. diags., photos., tab. (NACA RM L8D29) (Declassified from Restricted, 6/29/53)

AERODYNAMIC STUDY OF A WING-FUSELAGE COMBINATION EMPLOYING A WING SWEEP BACK 63° - INVESTIGATION OF A LARGE-SCALE MODEL AT LOW SPEED. Gerald M. McCormack and Walter C. Walling. January 21, 1949. 20p. diags., photos. (NACA RM A8D02) (Declassified from Restricted, 6/29/53)

EFFECTS OF SEVERAL LEADING-EDGE MODIFICATIONS ON THE STALLING CHARACTERISTICS OF A 45° SWEEP-FORWARD WING. Gerald M. McCormack and Woodrow L. Cook. June 14, 1949. 46p. diags., photo., tab. (NACA RM A9D29) (Reclassified from Restricted, 7/3/51)

INVESTIGATION AT LARGE SCALE OF THE PRESSURE DISTRIBUTION AND FLOW PHENOMENA OVER A WING WITH THE LEADING EDGE SWEEPED BACK 47.5° HAVING CIRCULAR-ARC AIRFOIL SECTIONS AND EQUIPPED WITH DROOPED-NOSE AND PLAIN FLAPS. Roy H. Lange, Edward F. Whittle, Jr. and Marvin P. Fink. September 8, 1949. 72p. diags., 3 tabs. (NACA RM L9G15) (Declassified from Restricted, 6/29/53)

EFFECTS OF BOUNDARY-LAYER CONTROL ON THE LONGITUDINAL CHARACTERISTICS OF A 45° SWEEP-FORWARD WING-FUSELAGE COMBINATION. Gerald M. McCormack and Woodrow L. Cook. February 2, 1950. 73p. diags., photo., 2 tabs. (NACA RM A9K02a) (Declassified from Restricted, 6/29/53)

EXAMPLES OF THREE REPRESENTATIVE TYPES OF AIRFOIL-SECTION STALL AT LOW SPEED. George B. McCullough and Donald E. Gault. September 1951. 52p. diags., photo., 6 tabs. (NACA TN 2502)

THE EFFECT OF RATE OF CHANGE OF ANGLE OF ATTACK ON THE MAXIMUM LIFT COEFFICIENT OF A PURSUIT AIRPLANE. Burnett L. Gadeberg. October 1951. 17p. diags., photo. (NACA TN 2525. Formerly RM A8I30)

EVALUATION OF HIGH-ANGLE-OF-ATTACK AERODYNAMIC-DERIVATIVE DATA AND STALL-FLUTTER PREDICTION TECHNIQUES. Robert L. Halfman, H. C. Johnson and S. M. Haley, Massachusetts Institute of Technology. November 1951. 154p. diags., photos., 11 tabs. (NACA TN 2533)

EFFECTS OF FINITE SPAN ON THE SECTION CHARACTERISTICS OF TWO 45° SWEEPED-BACK WINGS OF ASPECT RATIO 6. Lynn W. Hunton. March 17, 1952. 34p. diags. (NACA RM A52A10) (Declassified from Restricted, 4/10/53)

SUMMARY OF STALL-WARNING DEVICES. John A. Zalovcik. May 1952. 15p. diags. (NACA TN 2676)

EFFECTS OF MACH NUMBER VARIATION BETWEEN 0.07 AND 0.34 AND REYNOLDS NUMBER VARIATION BETWEEN  $0.97 \times 10^6$  AND  $8.10 \times 10^6$  ON THE MAXIMUM LIFT COEFFICIENT OF A WING OF NACA 64-210 AIRFOIL SECTIONS. James E. Fitzpatrick and William C. Schneider. August 1952. 34p. diags., photos., tab. (NACA TN 2753)

MEASUREMENTS OF FLYING QUALITIES OF AN F-47D-30 AIRPLANE TO DETERMINE LONGITUDINAL STABILITY AND CONTROL AND STALLING CHARACTERISTICS. Christopher C. Kraft, Jr., R. Fabian Goranson and John P. Reeder. February 1953. 75p. photos., diags., 2 tabs. (NACA TN 2899)

STUDY OF MOTION OF MODEL OF PERSONAL-OWNER OR LIAISON AIRPLANE THROUGH THE STALL AND INTO THE INCIPENT SPIN BY MEANS OF A FREE-FLIGHT TESTING TECHNIQUE. Ralph W. Stone, Jr., William G. Garner and Lawrence J. Gale. April 1953. 28p. diags., photos., tab. (NACA TN 2923)

METHOD FOR CALCULATING THE ROLLING AND YAWING MOMENTS DUE TO ROLLING FOR UNSWEPT WINGS WITH OR WITHOUT FLAPS ORAILERONS BY USE OF NONLINEAR SECTION LIFT DATA. Albert P. Martina. May 1953. 41p. diags., 11 tabs. (NACA TN 2937)

INVESTIGATION OF LATERAL CONTROL NEAR THE STALL. FLIGHT INVESTIGATION WITH A LIGHT HIGH-WING MONOPLANE TESTED WITH VARIOUS AMOUNTS OF WASHOUT AND VARIOUS LENGTHS OF LEADING-EDGE SLOT. Fred E. Weick, Maurice S. Sevelson, James G. McClure and Marion D. Flanagan, Agricultural and Mechanical College of Texas. May 1953. 61p. diags., photos., 4 tabs. (NACA TN 2948)

## FLYING QUALITIES (1.8.5)

LONGITUDINAL STABILITY AND CONTROL OF HIGH-SPEED AIRPLANES WITH PARTICULAR REFERENCE TO DIVE RECOVERY. John A. Axelson. September 4, 1947. 25p. diags. (NACA RM A7C24) (Reclassified from Restricted, 6/27/51)

FLIGHT CHARACTERISTICS AT LOW SPEED OF DELTA-WING MODELS. Marion O. McKinney, Jr. and Hubert M. Drake. January 13, 1948. 33p. diags., photos., tab. (NACA RM L7K07) (Reclassified from Restricted, 6/27/51)

## AERODYNAMICS

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#### *Flying Qualities (Cont.)*

A STUDY OF THE USE OF EXPERIMENTAL STABILITY DERIVATIVES IN THE CALCULATION OF THE LATERAL DISTURBED MOTIONS OF A SWEEP-WING AIRPLANE AND COMPARISON WITH FLIGHT RESULTS. John D. Bird and Byron M. Jaquet. 1951. ii, 25p. diags., photos., 4 tabs. (NACA Rept. 1031. Formerly TN 2013)

FLIGHT INVESTIGATION OF A MECHANICAL FEEL DEVICE IN AN IRREVERSIBLE ELEVATOR CONTROL SYSTEM OF A LARGE AIRPLANE. B. Porter Brown, Robert G. Chilton and James B. Whitten. October 1951. 47p. diags., photos. (NACA TN 2496)

EFFECTS ON LONGITUDINAL STABILITY AND CONTROL CHARACTERISTICS OF A BOEING B-29 AIRPLANE OF VARIATIONS IN STICK-FORCE AND CONTROL-RATE CHARACTERISTICS OBTAINED THROUGH USE OF A BOOSTER IN THE ELEVATOR CONTROL SYSTEM. Charles W. Mathews, Donald B. Talmage and James B. Whitten. 1952. ii, 17p. diags., photo., tab. (NACA Rept. 1076. Formerly TN 2238; RM L50D11)

FLIGHT INVESTIGATION OF THE EFFECT OF CONTROL CENTERING SPRINGS ON THE APPARENT SPIRAL STABILITY OF A PERSONAL-OWNER AIRPLANE. John P. Campbell, Paul A. Hunter, Donald E. Hewes and James B. Whitten. 1952. ii, 17p. diags., photo., 2 tabs. (NACA Rept. 1092. Formerly TN 2413)

SOME EFFECTS OF VARYING THE DAMPING IN PITCH AND ROLL ON THE FLYING QUALITIES OF A SMALL SINGLE-ROTOR HELICOPTER. John P. Reeder and James B. Whitten. January 1952. 23p. diags., photos., 4 tabs. (NACA TN 2459)

INITIAL RESULTS OF INSTRUMENT-FLYING TRIALS CONDUCTED IN A SINGLE-ROTOR HELICOPTER. Almer D. Crim, John P. Reeder and James B. Whitten. June 1952. 16p. diags., photos. (NACA TN 2721)

MEASUREMENTS OF FLYING QUALITIES OF AN F-47D-30 AIRPLANE TO DETERMINE LATERAL AND DIRECTIONAL STABILITY AND CONTROL CHARACTERISTICS. R. Fabian Goranson and Christopher C. Kraft, Jr. July 1952. 61p. diags., photos., 2 tabs. (NACA TN 2675)

THE EFFECTS OF DYNAMIC LATERAL STABILITY AND CONTROL OF LARGE ARTIFICIAL VARIATIONS IN THE ROTARY STABILITY DERIVATIVES. Robert O. Schade and James L. Hassell, Jr. October 1952. 56p. diags., photo., 2 tabs. (NACA TN 2781)

MEASUREMENTS OF FLYING QUALITIES OF AN F-47D-30 AIRPLANE TO DETERMINE LONGITUDINAL STABILITY AND CONTROL AND STALLING CHARACTERISTICS. Christopher C. Kraft, Jr., R. Fabian Goranson and John P. Reeder. February 1953. 75p. photos., diags., 2 tabs. (NACA TN 2899)

INVESTIGATION OF LATERAL CONTROL NEAR THE STALL. FLIGHT INVESTIGATION WITH A LIGHT HIGH-WING MONOPLANE TESTED WITH VARIOUS AMOUNTS OF WASHOUT AND VARIOUS LENGTHS OF LEADING-EDGE SLOT. Fred E. Weick, Maurice S. Sevelson, James G. McClure and Marion D. Flanagan, Agricultural and Mechanical College of Texas. May 1953. 61p. diags., photos., 4 tabs. (NACA TN 2948)

## MASS AND GYROSCOPIC PROBLEMS (1.8.6)

ESTIMATION OF THE MAXIMUM ANGLE OF SIDESLIP FOR DETERMINATION OF VERTICAL-TAIL LOADS IN ROLLING MANEUVERS. Ralph W. Stone, Jr. February 1952. 46p. diags., 4 tabs. (NACA TN 2633)

STUDY OF MOTION OF MODEL OF PERSONAL-OWNER OR LIAISON AIRPLANE THROUGH THE STALL AND INTO THE INCIPENT SPIN BY MEANS OF A FREE-FLIGHT TESTING TECHNIQUE. Ralph W. Stone, Jr., William G. Garner and Lawrence J. Gale. April 1953. 28p. diags., photos., tab. (NACA TN 2923)

## AUTOMATIC STABILIZATION (1.8.8)

A THEORETICAL ANALYSIS OF THE EFFECT OF TIME LAG IN AN AUTOMATIC STABILIZATION SYSTEM ON THE LATERAL OSCILLATORY STABILITY OF AN AIRPLANE. Leonard Sternfield and Ordway B. Gates, Jr. 1951. ii, 12p. diags. (NACA Rept. 1018. Formerly TN 2005)

BENCH-TEST INVESTIGATION OF THE TRANSIENT-RESPONSE CHARACTERISTICS OF SEVERAL SIMULATED AIRPLANES INCORPORATING AN AUTOPILOT SENSITIVE TO YAWING ACCELERATIONS. Donald A. Howard. July 1951. 27p. diags., photos., 2 tabs. (NACA TN 2395)

THEORETICAL STUDY OF SOME METHODS FOR INCREASING THE SMOOTHNESS OF FLIGHT THROUGH ROUGH AIR. William H. Phillips and Christopher C. Kraft, Jr. July 1951. 96p. diags., 3 tabs. (NACA TN 2416)

EFFECT OF AN AUTOPILOT SENSITIVE TO YAWING VELOCITY ON THE LATERAL STABILITY OF A TYPICAL HIGH-SPEED AIRPLANE. Ordway B. Gates, Jr. and Leonard Sternfield. September 1951. 29p. diags., 2 tabs. (NACA TN 2470)

A THEORETICAL ANALYSIS OF THE EFFECT OF SEVERAL AUXILIARY DAMPING DEVICES ON THE LATERAL STABILITY AND CONTROLLABILITY OF A HIGH-SPEED AIRCRAFT. Ordway B. Gates, Jr. December 1951. 39p. diags., 6 tabs. (NACA TN 2565)

*Automatic Stabilization (Cont.)*

**THEORETICAL ANALYSIS OF SOME SIMPLE TYPES OF ACCELERATION RESTRICTORS.**

William H. Phillips. December 1951. 35p. diagrs., 2 tabs. (NACA TN 2574)

**A COMPARISON OF PREDICTED AND EXPERIMENTALLY DETERMINED LONGITUDINAL DYNAMIC RESPONSES OF A STABILIZED AIRPLANE.**

Louis H. Smaus, Marvin R. Gore and Merle G. Waugh. December 1951. 53p. diagrs., photos. (NACA TN 2578)

**ANALOGUE-COMPUTER SIMULATION OF AN AUTOPILOT SERVO SYSTEM HAVING NONLINEAR RESPONSE CHARACTERISTICS.** Arthur L. Jones and John S. White. June 1952. 30p. diagrs. (NACA TN 2707)

**ON THE REPRESENTATION OF THE STABILITY REGION IN OSCILLATION PROBLEMS WITH THE AID OF THE HURWITZ DETERMINANTS.** (Zur Darstellung des Stabilitätsgebietes bei Schwingungsaufgaben mit Hilfe der Hurwitz-Determinanten). E. Sponder. August 1952. 12p. diagrs. (NACA TM 1348. Trans from Schweizer Archiv für angewandte Wissenschaft und Technik, v. 16, no. 3, March 1950, p. 93-96).

**THE EFFECTS OF DYNAMIC LATERAL STABILITY AND CONTROL OF LARGE ARTIFICIAL VARIATIONS IN THE ROTARY STABILITY DERIVATIVES.**

Robert O. Schade and James L. Hassell, Jr. October 1952. 56p. diagrs., photo., 2 tabs. (NACA TN 2781)

**A THEORETICAL METHOD OF ANALYZING THE EFFECTS OF YAW-DAMPER DYNAMICS ON THE STABILITY OF AN AIRCRAFT EQUIPPED WITH A SECOND-ORDER YAW DAMPER.** Albert A. Schy and Ordway B. Gates, Jr. December 1952. 72p. diagrs., 2 tabs. (NACA TN 2857)

**THEORETICAL INVESTIGATION OF THE LONGITUDINAL RESPONSE CHARACTERISTICS OF A SWEPT-WING FIGHTER AIRPLANE HAVING A PITCH-ATTITUDE CONTROL SYSTEM.** Fred H. Stokes and J. T. Matthews. January 1953. 41p. diagrs., tab. (NACA TN 2882)

## Aeroelasticity (1.9)

**CALCULATION OF THE AERODYNAMIC LOADING OF SWEEPED AND UNSWEEPED FLEXIBLE WINGS OF ARBITRARY STIFFNESS.** Franklin W. Diederich. 1950. ii, 29p. diags., 10 tabs. (NACA Rept. 1000. Formerly RM L8G27a, TN 1876)

**ANALYSIS OF PURE-BENDING FLUTTER OF A CANTILEVER SWEEPED WING AND ITS RELATION TO BENDING-TORSION FLUTTER.** H. J. Cunningham. September 1951. 24p. diags. (NACA TN 2461)

**FLIGHT INVESTIGATION OF SOME FACTORS AFFECTING THE CRITICAL TAIL LOADS ON LARGE AIRPLANES.** Harvey H. Brown. September 1951. 119p. diags., photos., 2 tabs. (NACA TN 2490)

**CHARTS AND APPROXIMATE FORMULAS FOR THE ESTIMATION OF AEROELASTIC EFFECTS ON THE LOADING OF SWEEPED AND UNSWEEPED WINGS.** Franklin W. Diederich and Kenneth A. Foss. February 1952. 98p. diags., 3 tabs. (NACA TN 2608)

**CHARTS AND APPROXIMATE FORMULAS FOR THE ESTIMATION OF AEROELASTIC EFFECTS ON THE LATERAL CONTROL OF SWEEPED AND UNSWEEPED WINGS.** Kenneth A. Foss and Franklin W. Diederich. July 1952. 70p. diags., 2 tabs. (NACA TN 2747)

**AN ANALYSIS OF THE FACTORS AFFECTING THE LOSS IN LIFT AND SHIFT IN AERODYNAMIC CENTER PRODUCED BY THE DISTORTION OF A SWEEPED WING UNDER AERODYNAMIC LOAD.** Charles W. Mathews and Max C. Kurbjun. March 1953. 65p. diags. (NACA TN 2901)

## Parachutes (1.10)

METHOD OF ESTIMATING THE MINIMUM SIZE  
OF A TAIL OR WING-TIP PARACHUTE FOR  
EMERGENCY SPIN RECOVERY OF AN AIRPLANE.  
Frank S. Malvestuto, Jr. October 27, 1948. 42p.  
diags., photos., 4 tabs. (NACA RM L8D27)  
(Reclassified from Confidential, 7/3/51)

# **HYDRODYNAMICS**

**(2)**

# HYDRODYNAMICS

## (2)

HYDRODYNAMIC IMPACT OF A SYSTEM WITH A SINGLE ELASTIC MODE. I - THEORY AND GENERALIZED SOLUTION WITH AN APPLICATION TO AN ELASTIC AIRFRAME. Wilbur L. Mayo. 1952. ii, 17p. diags., 2 tabs. (NACA Rept. 1074. Formerly TN 1398)

HYDRODYNAMIC IMPACT OF A SYSTEM WITH A SINGLE ELASTIC MODE. II-COMPARISON OF EXPERIMENTAL FORCE AND RESPONSE WITH THEORY. Robert W. Miller and Kenneth F. Merten. 1952. ii, 7p. diags., photos., tab. (NACA Rept. 1075. Formerly TN 2343)

TRANSLATIONAL MOTION OF BODIES UNDER THE FREE SURFACE OF A HEAVY FLUID OF FINITE DEPTH. (O postupatel'nom dvizhenii tel pod svobodnoi poverkhnost'yu tyazheloi zhidkosti konechnoi glubiny). M. D. Haskind. June 1952. 20p. diagr. (NACA TM 1345. Trans. from Prikladnaya Matematika i Mekhanika, v. 9, no. 1, September 1945, p. 67-78).

AVERAGE SKIN-FRICTION DRAG COEFFICIENTS FROM TANK TESTS OF A PARABOLIC BODY OF REVOLUTION (NACA RM-10). Elmo J. Mottard and J. Dan Lopper. January 1953. 18p. diags., photos. (NACA TN 2854)



## Theory

### (2.1)

A SEMIEMPIRICAL PROCEDURE FOR COMPUTING THE WATER-PRESSURE DISTRIBUTION ON FLAT AND V-BOTTOM PRISMATIC SURFACES DURING IMPACT OR PLANING. Robert F. Smiley. December 1951. 28p. diags. (NACA TN 2583)

BEHAVIOR OF VORTEX SYSTEM BEHIND CRUCIFORM WINGS - MOTIONS OF FULLY ROLLED-UP VORTICES. Alvin H. Sacks. January 1952. 40p. photos., diags. (NACA TN 2605)

THEORETICAL ANALYSIS OF HYDRODYNAMIC IMPACT OF A PRISMATIC FLOAT HAVING FREEDOM IN TRIM. Robert W. Miller. June 1952. 31p. diags., 2 tabs. (NACA TN 2698)

TRANSLATIONAL MOTION OF BODIES UNDER THE FREE SURFACE OF A HEAVY FLUID OF FINITE DEPTH. (O postupatel'nom dvizhenii tel pod svobodnoi poverkhnost'yu tyazheloi zhidkosti konechnoi glubiny). M. D. Haskind. June 1952. 20p. diagr. (NACA TM 1345. Trans. from Prikladnaya Matematika i Mekhanika, v. 9, no. 1, September 1945, p. 67-78).

THEORY AND PROCEDURE FOR DETERMINING LOADS AND MOTIONS IN CHINE-IMMERSED HYDRODYNAMIC IMPACTS OF PRISMATIC BODIES. Emanuel Schnitzer. November 1952. 51p. diags. (NACA TN 2813)

THE APPLICATION OF PLANING CHARACTERISTICS TO THE CALCULATION OF THE WATER-LANDING LOADS AND MOTIONS OF SEAPLANES OF ARBITRARY CONSTANT CROSS SECTION. Robert F. Smiley. November 1952. 37p. diags. (NACA TN 2814)

A THEORETICAL INVESTIGATION OF THE EFFECT OF PARTIAL WING LIFT ON HYDRODYNAMIC LANDING CHARACTERISTICS OF V-BOTTOM SEAPLANES IN STEP IMPACTS. Joseph L. Sims and Emanuel Schnitzer. November 1952. 20p. diags. (NACA TN 2815)

WATER-PRESSURE DISTRIBUTIONS DURING LANDINGS OF A PRISMATIC MODEL HAVING AN ANGLE OF DEAD RISE OF  $22\frac{1}{2}^\circ$  AND BEAM-LOADING COEFFICIENTS OF 0.48 AND 0.97. Robert F. Smiley. November 1952. 37p. diags., 6 tabs. (NACA TN 2816)

A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF YAW ON PRESSURES, FORCES, AND MOMENTS DURING SEAPLANE LANDINGS AND PLANING. Robert F. Smiley. November 1952. 98p. diags., 7 tabs. (NACA TN 2817)

ON THE THEORY OF THE TURBULENT BOUNDARY LAYER. (Über die Theorie der turbulenten Grenzschichten). J. Rotta. February 1953. 50p. diags. (NACA TM 1344. Trans. from Max-Planck-Institut für Strömungsforschung, Göttingen. Mitteilungen 1, 1950)

ESTIMATION OF HYDRODYNAMIC IMPACT LOADS AND PRESSURE DISTRIBUTIONS ON BODIES APPROXIMATING ELLIPTICAL CYLINDERS WITH SPECIAL REFERENCE TO WATER LANDINGS OF HELICOPTERS. Emanuel Schnitzer and Melvin E. Hathaway. April 1953. 31p. diags. (NACA TN 2889)

WATER-LANDING INVESTIGATION OF A FLAT-BOTTOM V-STEP MODEL AND COMPARISON WITH A THEORY INCORPORATING PLANING DATA. Robert W. Miller. May 1953. 23p. diags., photo., 2 tabs. (NACA TN 2932)

## General Arrangement Studies

### (2.2)

**HYDRODYNAMIC CHARACTERISTICS OF AERODYNAMICALLY REFINED PLANING-TAIL HULLS.** Robert McKann and Claude W. Coffee. March 28, 1949. 41p. diags., photos. (NACA RM L9B04) (Declassified from Confidential, 6/11/53)

**EFFECT OF AN INCREASE IN HULL LENGTH-BEAM RATIO FROM 15 TO 20 ON THE HYDRODYNAMIC CHARACTERISTICS OF FLYING BOATS.** Arthur W. Carter and Walter E. Whitaker, Jr. August 24, 1949. 29p. diags., photos., 2 tabs. (NACA RM L9G05) (Declassified from Restricted, 9/16/52)

**HYDRODYNAMIC CHARACTERISTICS OF A SWEPT PLANING-TAIL HULL.** Robert E. McKann, Claude W. Coffee and Donald D. Arabian. September 12, 1949. 34p. diags., photos., tab. (NACA RM L9D15) (Declassified from Confidential, 6/11/53)

**HYDRODYNAMIC INVESTIGATION OF A SERIES OF HULL MODELS SUITABLE FOR SMALL FLYING BOATS AND AMPHIBIANS.** W. C. Hugli, Jr. and W. C. Axt, Stevens Institute of Technology. November 1951. 122p. diags., photos., 4 tabs. (NACA TN 2503)

**HYDRODYNAMIC CHARACTERISTICS OF A LOW-DRAG, PLANING-TAIL FLYING-BOAT HULL.** Henry B. Suydam. January 1952. 20p. diags., photo., tab. (NACA TN 2481. Formerly RM L7I10)

**THEORETICAL ANALYSIS OF HYDRODYNAMIC IMPACT OF A PRISMATIC FLOAT HAVING FREEDOM IN TRIM.** Robert W. Miller. June 1952. 31p. diags., 2 tabs. (NACA TN 2698)

**THE PLANING CHARACTERISTICS OF A SURFACE HAVING A BASIC ANGLE OF DEAD RISE OF  $20^{\circ}$  AND HORIZONTAL CHINE FLARE.** Walter J. Kapryan and Irving Weinstein. October 1952. 42p. diags., photos., 2 tabs. (NACA TN 2804)

**THE PLANING CHARACTERISTICS OF A SURFACE HAVING A BASIC ANGLE OF DEAD RISE OF  $40^{\circ}$  AND HORIZONTAL CHINE FLARE.** Ulysse J. Blanchard. December 1952. 26p. diags., photo., tab. (NACA TN 2842)

**THE PLANING CHARACTERISTICS OF TWO V-SHAPED PRISMATIC SURFACES HAVING ANGLES OF DEAD RISE OF  $20^{\circ}$  and  $40^{\circ}$ .** Derrill B. Chambliss and George M. Boyd, Jr. January 1953. 38p. diags., photos., 2 tabs. (NACA TN 2876)

**EXPERIMENTAL INVESTIGATION OF THE EFFECT OF REAR-FUSELAGE SHAPE ON DITCHING BEHAVIOR.** Ellis E. McBride and Lloyd J. Fisher. April 1953. 35p. diags., photos., 3 tabs. (NACA TN 2929)

**WATER-LANDING INVESTIGATION OF A FLAT-BOTTOM V-STEP MODEL AND COMPARISON WITH A THEORY INCORPORATING PLANING DATA.** Robert W. Miller. May 1953. 23p. diags., photo., 2 tabs. (NACA TN 2932)

# Seaplane Hull Variables

## (2.3)

### LENGTH-BEAM RATIO

#### (2.3.1)

AERODYNAMIC CHARACTERISTICS OF FLYING-BOAT HULLS HAVING LENGTH-BEAM RATIOS OF 20 AND 30. John M. Riebe. November 10, 1948. 26p. diagrs., photos., 4 tabs. (NACA RM L8H11) (Declassified from Restricted, 9/16/52)

EFFECT OF AN INCREASE IN HULL LENGTH-BEAM RATIO FROM 15 TO 20 ON THE HYDRODYNAMIC CHARACTERISTICS OF FLYING BOATS. Arthur W. Carter and Walter E. Whitaker, Jr. August 24, 1949. 29p. diagrs., photos., 2 tabs. (NACA RM L9G05) (Declassified from Restricted, 9/16/52)

AN EXPERIMENTAL STUDY OF WATER-PRESSURE DISTRIBUTIONS DURING LANDINGS AND PLANING OF A HEAVILY LOADED RECTANGULAR FLAT-PLATE MODEL. Robert F. Smiley. September 1951. 40p. diagrs., 3 tabs. (NACA TN 2453)

HYDRODYNAMIC INVESTIGATION OF A SERIES OF HULL MODELS SUITABLE FOR SMALL FLYING BOATS AND AMPHIBIANS. W. C. Hugli, Jr. and W. C. Axt, Stevens Institute of Technology. November 1951. 122p. diagrs., photos., 4 tabs. (NACA TN 2503)

A SEMIEMPIRICAL PROCEDURE FOR COMPUTING THE WATER-PRESSURE DISTRIBUTION ON FLAT AND V-BOTTOM PRISMATIC SURFACES DURING IMPACT OR PLANING. Robert F. Smiley. December 1951. 28p. diagrs. (NACA TN 2583)

THE PLANING CHARACTERISTICS OF A SURFACE HAVING A BASIC ANGLE OF DEAD RISE OF  $20^\circ$  AND HORIZONTAL CHINE FLARE. Walter J. Kapryan and Irving Weinstein. October 1952. 42p. diagrs., photos., 2 tabs. (NACA TN 2804)

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THE APPLICATION OF PLANING CHARACTERISTICS TO THE CALCULATION OF THE WATER-LANDING LOADS AND MOTIONS OF SEAPLANES OF ARBITRARY CONSTANT CROSS SECTION. Robert F. Smiley. November 1952. 37p. diagrs. (NACA TN 2814)

THE PLANING CHARACTERISTICS OF A SURFACE HAVING A BASIC ANGLE OF DEAD RISE OF  $40^\circ$  AND HORIZONTAL CHINE FLARE. Ulysse J. Blanchard. December 1952. 26p. diagrs., photo., tab. (NACA TN 2842)

THE PLANING CHARACTERISTICS OF TWO V-SHAPED PRISMATIC SURFACES HAVING ANGLES OF DEAD RISE OF  $20^\circ$  AND  $40^\circ$ . Derrill B. Chambliss and George M. Boyd, Jr. January 1953. 38p. diagrs., photos., 2 tabs. (NACA TN 2876)

WATER-LANDING INVESTIGATION OF A FLAT-BOTTOM V-STEP MODEL AND COMPARISON WITH A THEORY INCORPORATING PLANING DATA. Robert W. Miller. May 1953. 23p. diagrs., photo., 2 tabs. (NACA TN 2932)

### DEAD RISE

#### (2.3.2)

AN EXPERIMENTAL STUDY OF WATER-PRESSURE DISTRIBUTIONS DURING LANDINGS AND PLANING OF A HEAVILY LOADED RECTANGULAR FLAT-PLATE MODEL. Robert F. Smiley. September 1951. 40p. diagrs., 3 tabs. (NACA TN 2453)

A SEMIEMPIRICAL PROCEDURE FOR COMPUTING THE WATER-PRESSURE DISTRIBUTION ON FLAT AND V-BOTTOM PRISMATIC SURFACES DURING IMPACT OR PLANING. Robert F. Smiley. December 1951. 28p. diagrs. (NACA TN 2583)

THE PLANING CHARACTERISTICS OF A SURFACE HAVING A BASIC ANGLE OF DEAD RISE OF  $20^\circ$  AND HORIZONTAL CHINE FLARE. Walter J. Kapryan and Irving Weinstein. October 1952. 42p. diagrs., photos., 2 tabs. (NACA TN 2804)

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*Dead rise (Cont.)*

THE PLANING CHARACTERISTICS OF A SURFACE HAVING A BASIC ANGLE OF DEAD RISE OF  $40^\circ$  AND HORIZONTAL CHINE FLARE. Ulysse J. Blanchard. December 1952. 26p. diagrs., photo., tab. (NACA TN 2842)

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**STEPS****(2.3.3)**

HYDRODYNAMIC CHARACTERISTICS OF AERO-DYNAMICALLY REFINED PLANING-TAIL HULLS. Robert McKann and Claude W. Coffee. March 28, 1949. 41p. diagrs., photos. (NACA RM L9B04) (Declassified from Confidential, 6/11/53)

HYDRODYNAMIC CHARACTERISTICS OF A SWEEP PLANING-TAIL HULL. Robert E. McKann, Claude W. Coffee and Donald D. Arabian. September 12, 1949. 34p. diagrs., photos., tab. (NACA RM L9D15) (Declassified from Confidential, 6/11/53)

**AFTERBODY SHAPE****(2.3.4)**

HYDRODYNAMIC CHARACTERISTICS OF AERO-DYNAMICALLY REFINED PLANING-TAIL HULLS. Robert McKann and Claude W. Coffee. March 28, 1949. 41p. diagrs., photos. (NACA RM L9B04) (Declassified from Confidential, 6/11/53)

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LANDING CHARACTERISTICS IN WAVES OF THREE DYNAMIC MODELS OF FLYING BOATS. James M. Benson, Robert F. Havens and David R. Woodward. January 1952. 41p. diagrs., photo., 2 tabs. (NACA TN 2508. Formerly RM L6L13)

**FOREBODY SHAPE****(2.3.5)**

HYDRODYNAMIC CHARACTERISTICS OF AERO-DYNAMICALLY REFINED PLANING-TAIL HULLS. Robert McKann and Claude W. Coffee. March 28, 1949. 41p. diagrs., photos. (NACA RM L9B04) (Declassified from Confidential, 6/11/53)

HYDRODYNAMIC CHARACTERISTICS OF A SWEEP PLANING-TAIL HULL. Robert E. McKann, Claude W. Coffee and Donald D. Arabian. September 12, 1949. 34p. diagrs., photos., tab. (NACA RM L9D15) (Declassified from Confidential, 6/11/53)

**CHINES****(2.3.6)**

HYDRODYNAMIC CHARACTERISTICS OF AERO-DYNAMICALLY REFINED PLANING-TAIL HULLS. Robert McKann and Claude W. Coffee. March 28, 1949. 41p. diagrs., photos. (NACA RM L9B04) (Declassified from Confidential, 6/11/53)

HYDRODYNAMIC CHARACTERISTICS OF A SWEEP PLANING-TAIL HULL. Robert E. McKann, Claude W. Coffee and Donald D. Arabian. September 12, 1949. 34p. diagrs., photos., tab. (NACA RM L9D15) (Declassified from Confidential, 6/11/53)

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THE PLANING CHARACTERISTICS OF A SURFACE HAVING A BASIC ANGLE OF DEAD RISE OF  $40^\circ$  AND HORIZONTAL CHINE FLARE. Ulysse J. Blanchard. December 1952. 26p. diagrs., photo., tab. (NACA TN 2842)

## **Specific Seaplanes and Hulls**

**(2.4)**

LANDING CHARACTERISTICS IN WAVES OF THREE  
DYNAMIC MODELS OF FLYING BOATS. James M.  
Benson, Robert F. Havens and David R. Woodward.  
January 1952. 41p. diags., photo., 2 tabs.  
(NACA TN 2508. Formerly RM L6L13)

## **Lateral Stabilizers**

### **(2.5)**

HYDRODYNAMIC CHARACTERISTICS OF AERO-  
DYNAMICALLY REFINED PLANING-TAIL HULLS.  
Robert McKann and Claude W. Coffee. March 28,  
1949. 41p. diagrs., photos. (NACA RM L9B04)  
(Declassified from Confidential, 6/11/53)

## Planing Surfaces

### (2.6)

AN EXPERIMENTAL STUDY OF WATER-PRESSURE DISTRIBUTIONS DURING LANDINGS AND PLANING OF A HEAVILY LOADED RECTANGULAR FLAT-PLATE MODEL. Robert F. Smiley. September 1951. 40p. diagrs., 3 tabs. (NACA TN 2453)

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## Hydrofoils

### (2.7)

TANK TESTS AT SUBCAVITATION SPEEDS OF AN ASPECT-RATIO-10 HYDROFOIL WITH A SINGLE STRUT. Kenneth L. Wadiin, John A. Ramsen and John R. McGehee. July 20, 1950. 31p. diagrs., photos. (NACA RM L9K14a) (Declassified from Confidential, 2/12/53)

AN EXPERIMENTAL STUDY OF WATER-PRESSURE DISTRIBUTIONS DURING LANDINGS AND PLANING OF A HEAVILY LOADED RECTANGULAR FLAT-PLATE MODEL. Robert F. Smiley. September 1951. 40p. diagrs., 3 tabs. (NACA TN 2453)

THEORY AND PROCEDURE FOR DETERMINING LOADS AND MOTIONS IN CHINE-IMMERSED HYDRODYNAMIC IMPACTS OF PRISMATIC BODIES. Emanuel Schnitzer. November 1952. 51p. diagrs. (NACA TN 2813)



## Ditching Characteristics

### (2.9)

ESTIMATION OF HYDRODYNAMIC IMPACT LOADS AND PRESSURE DISTRIBUTIONS ON BODIES APPROXIMATING ELLIPTICAL CYLINDERS WITH SPECIAL REFERENCE TO WATER LANDINGS OF HELICOPTERS. Emanuel Schnitzer and Melvin E. Hathaway. April 1953. 31p. diagrs. (NACA TN 2889)

EXPERIMENTAL INVESTIGATION OF THE EFFECT OF REAR-FUSELAGE SHAPE ON DITCHING BEHAVIOR. Ellis E. McBride and Lloyd J. Fisher. April 1953. 35p. diagrs., photos., 3 tabs. (NACA TN 2929)

## Stability and Control

### (2.10)

#### LONGITUDINAL

##### (2.10.1)

EFFECT OF AN INCREASE IN HULL LENGTH-BEAM RATIO FROM 15 TO 20 ON THE HYDRODYNAMIC CHARACTERISTICS OF FLYING BOATS. Arthur W. Carter and Walter E. Whitaker, Jr. August 24, 1949. 29p. diags., photos., 2 tabs. (NACA RM L9G05) (Declassified from Restricted, 9/16/52)

HYDRODYNAMIC INVESTIGATION OF A SERIES OF HULL MODELS SUITABLE FOR SMALL FLYING BOATS AND AMPHIBIANS. W. C. Hugli, Jr. and W. C. Axt, Stevens Institute of Technology. November 1951. 122p. diags., photos., 4 tabs. (NACA TN 2503)

THEORETICAL ANALYSIS OF HYDRODYNAMIC IMPACT OF A PRISMATIC FLOAT HAVING FREEDOM IN TRIM. Robert W. Miller. June 1952. 31p. diags., 2 tabs. (NACA TN 2698)

#### DIRECTIONAL

##### (2.10.3)

HYDRODYNAMIC DIRECTIONAL BEHAVIOR OF A SWEEP PLANING-TAIL HULL. Donald D. Arabian. January 1952. 15p. diags., photo. (NACA RM L51F04)  
CONFIDENTIAL

**PROPULSION**

**(3)**

## Complete Systems

### (3.1)

METHOD AND GRAPHS FOR THE EVALUATION OF AIR-INDUCTION SYSTEMS. George B. Brajnikoff. April 1952. 41p. diagrs., tab. (NACA TN 2697)

## RECIPROCATING ENGINES

### (3.1.1)

NACA INVESTIGATION OF FUEL PERFORMANCE IN PISTON-TYPE ENGINES. Henry C. Barnett. 1951. vi, 102p. diagrs., photos., 32 tabs. (NACA Rept. 1026)

## RECIPROCATING ENGINES-TURBINES

### (3.1.2)

CALORIMETRIC DETERMINATION OF CONSTANT-PRESSURE SPECIFIC HEATS OF CARBON DIOXIDE AT ELEVATED PRESSURES AND TEMPERATURES. Virgil E. Schrock, University of California. December 1952. 46p. diagrs., 2 tabs. (NACA TN 2838)

## TURBOJET ENGINES

### (3.1.3)

INVESTIGATION OF THRUST AUGMENTATION OF A 1600-POUND THRUST CENTRIFUGAL-FLOW-TYPE TURBOJET ENGINE BY INJECTION OF REFRIGERANTS AT COMPRESSOR INLETS. William L. Jones and Harry W. Dowman. August 25, 1947. 44p. diagrs., photo., tab. (NACA RM E7G23) (Declassified from Restricted, 6/5/53)

ANALYTICAL INVESTIGATION OF DISTRIBUTION OF CENTRIFUGAL STRESSES AND THEIR RELATION TO LIMITING OPERATING TEMPERATURES IN GAS-TURBINE BLADES. Richard H. Kemp and William C. Morgan. April 12, 1948. 25p. photo., diagrs. (NACA RM E7L05) (Declassified from Restricted, 6/11/53)

ANALYSIS OF THRUST AUGMENTATION OF TURBOJET ENGINES BY WATER INJECTION AT COMPRESSOR INLET INCLUDING CHARTS FOR CALCULATING COMPRESSION PROCESSES WITH WATER INJECTION. E. Clinton Wilcox and Arthur M. Trout. 1951. ii, 20p. diagrs. (NACA Rept. 1006. Formerly TN 2104; TN 2105)

ANALYTICAL METHOD FOR DETERMINING PERFORMANCE OF TURBOJET-ENGINE TAIL-PIPE HEAT EXCHANGERS. Michael Behun and Harrison C. Chandler, Jr. September 1951. 42p. diagrs. (NACA TN 2456)

EFFECTS OF SOME SOLUTION TREATMENTS FOLLOWED BY AN AGING TREATMENT ON THE LIFE OF SMALL CAST GAS-TURBINE BLADES OF A COBALT-CHROMIUM-BASE ALLOY. II - EFFECT OF SELECTED COMBINATIONS OF SOAKING TIME, TEMPERATURE, AND COOLING RATE. C. A. Hoffman and C. F. Robards. October 1951. 19p. diagrs., photos., 4 tabs. (NACA TN 2513)

EVALUATION OF THREE METHODS FOR DETERMINING DYNAMIC CHARACTERISTICS OF A TURBOJET ENGINE. Gene J. Delio. February 1952. 56p. diagrs., 6 tabs. (NACA TN 2634)

APPLICATION OF LINEAR ANALYSIS TO AN EXPERIMENTAL INVESTIGATION OF A TURBOJET ENGINE WITH PROPORTIONAL SPEED CONTROL. Marcel Dandois and David Novik. February 1952. 38p. diagrs., photos. (NACA TN 2642)

A SURVEY OF THE AIRCRAFT-NOISE PROBLEM WITH SPECIAL REFERENCE TO ITS PHYSICAL ASPECTS. Harvey H. Hubbard. May 1952. 41p. diagrs., photos. (NACA TN 2701)

EFFECT OF COMPRESSOR-OUTLET AIR BLEED ON PERFORMANCE OF A CENTRIFUGAL-FLOW TURBOJET ENGINE WITH A CONSTANT-AREA JET NOZZLE. Sidney C. Huntley. June 1952. 20p. diagrs. (NACA TN 2713)

NOISE FROM INTERMITTENT JET ENGINES AND STEADY-FLOW JET ENGINES WITH ROUGH BURNING. Leslie W. Lassiter. August 1952. 21p. diagrs. (NACA TN 2756)

EXPERIMENTAL STUDIES OF NOISE FROM SUBSONIC JETS IN STILL AIR. Leslie W. Lassiter and Harvey H. Hubbard. August 1952. 35p. diagrs., photos., tab. (NACA TN 2757)

SIMULATION OF LINEARIZED DYNAMICS OF GAS-TURBINE ENGINES. J. R. Ketchum and R. T. Craig. November 1952. 25p. diagrs., photo. (NACA TN 2826)

## TURBO-PROPELLER ENGINES

### (3.1.4)

INVESTIGATION OF FREQUENCY-RESPONSE CHARACTERISTICS OF ENGINE SPEED FOR A TYPICAL TURBINE-PROPELLER ENGINE. Burt L. Taylor, III and Frank L. Oppenheimer. 1951. 11p. diagrs., 2 tabs. (NACA Rept. 1017. Formerly TN 2184)

## PROPULSION 108 COMPLETE SYSTEM (3.1)

### *Turbo-Propeller (Cont.)*

METHOD OF MATCHING COMPONENTS AND PREDICTING PERFORMANCE OF A TURBINE-PROPELLER ENGINE. Alois T. Sutor and Morris A. Zipkin. September 1951. 75p. diags. (NACA TN 2450)

EFFECTS OF SOME SOLUTION TREATMENTS FOLLOWED BY AN AGING TREATMENT ON THE LIFE OF SMALL CAST GAS-TURBINE BLADES OF A COBALT-CHROMIUM-BASE ALLOY. II - EFFECT OF SELECTED COMBINATIONS OF SOAKING TIME, TEMPERATURE, AND COOLING RATE. C. A. Hoffman and C. F. Robards. October 1951. 19p. diags., photos., 4 tabs. (NACA TN 2513)

A THERMODYNAMIC STUDY OF THE TURBINE-PROPELLER ENGINE. Benjamin Pinkel and Irving M. Karp. March 1952. 90p. diags. (NACA TN 2653)

THEORETICAL AUGMENTATION OF TURBINE-PROPELLER ENGINE BY COMPRESSOR-INLET WATER INJECTION, TAIL-PIPE BURNING, AND THEIR COMBINATION. Reece V. Hensley. March 1952. 43p. diags. (NACA TN 2672)

A SURVEY OF THE AIRCRAFT-NOISE PROBLEM WITH SPECIAL REFERENCE TO ITS PHYSICAL ASPECTS. Harvey H. Hubbard. May 1952. 41p. diags., photos. (NACA TN 2701)

SIMULATION OF LINEARIZED DYNAMICS OF GAS-TURBINE ENGINES. J. R. Ketchum and R. T. Craig. November 1952. 25p. diags., photo. (NACA TN 2826)

### PULSE-JET ENGINES (3.1.6)

A SURVEY OF THE AIRCRAFT-NOISE PROBLEM WITH SPECIAL REFERENCE TO ITS PHYSICAL ASPECTS. Harvey H. Hubbard. May 1952. 41p. diags., photos. (NACA TN 2701)

EXTENSION TO THE CASES OF TWO DIMENSIONAL AND SPHERICALLY SYMMETRIC FLOWS OF TWO PARTICULAR SOLUTIONS TO THE EQUATIONS OF MOTION GOVERNING UNSTEADY FLOW IN A GAS. (Estensione ai Casi di Simmetria Centrale Bi-e Tri-Dimensionale di Due Particolari Soluzioni delle Equazioni del Moto Gassoso Non Permanente). Lorenzo Poggi. June 1952. 6p. (NACA TM 1332. Trans. from Onore di Modesto Panetti, November 25, 1950.)

NOISE FROM INTERMITTENT JET ENGINES AND STEADY-FLOW JET ENGINES WITH ROUGH BURNING. Leslie W. Lassiter. August 1952. 21p. diags. (NACA TN 2756)

### RAM-JET ENGINES (3.1.7)

FREE-FLIGHT INVESTIGATION OF 16-INCH-DIAMETER SUPERSONIC RAM-JET UNIT. George F. Kinghorn and John H. Disher. May 28, 1948. 20p. diags., photos. (NACA RM E8A26) (Declassified from Confidential, 6/11/53)

THEORETICAL AND EXPERIMENTAL INVESTIGATION OF ADDITIVE DRAG. Merwin Sibulkin. May 21, 1951. 33p. diags. (NACA RM E51B13) (Declassified from Confidential, 6/11/53)

A SURVEY OF THE AIRCRAFT-NOISE PROBLEM WITH SPECIAL REFERENCE TO ITS PHYSICAL ASPECTS. Harvey H. Hubbard. May 1952. 41p. diags., photos. (NACA TN 2701)

NOISE FROM INTERMITTENT JET ENGINES AND STEADY-FLOW JET ENGINES WITH ROUGH BURNING. Leslie W. Lassiter. August 1952. 21p. diags. (NACA TN 2756)

### ROCKET ENGINES (3.1.8)

A STUDY OF SEVERAL PARAMETERS CONTROLLING THE TRAJECTORIES OF A SUPERSONIC ANTIAIRCRAFT MISSILE POWERED WITH SOLID-OR LIQUID-FUEL ROCKETS. Ralph F. Huntsberger. April 24, 1947. 42p. diags. (NACA RM A6G22) (Declassified from Restricted, 6/5/53)

INTERNAL-FILM COOLING OF ROCKET NOZZLES. J. L. Sloop and George R. Kinney. June 8, 1948. 40p. diags., photos. (NACA RM E8A29a) (Declassified from Restricted, 1/3/52)

A SURVEY OF THE AIRCRAFT-NOISE PROBLEM WITH SPECIAL REFERENCE TO ITS PHYSICAL ASPECTS. Harvey H. Hubbard. May 1952. 41p. diags., photos. (NACA TN 2701)

COMBUSTION INSTABILITY IN AN ACID-HEPTANE ROCKET WITH A PRESSURIZED-GAS PROPELLANT PUMPING SYSTEM. Adelbert O. Tischler and Donald R. Bellman. May 1953. 50p. diags., photo. (NACA TN 2936. Formerly RM E51G11)

### JET-DRIVEN ROTORS (3.1.9)

AN ANALYSIS OF LAMINAR FREE-CONVECTION FLOW AND HEAT TRANSFER ABOUT A FLAT PLATE PARALLEL TO THE DIRECTION OF THE GENERATING BODY FORCE. Simon Ostrach. February 1952. 47p. diags., tab. (NACA TN 2635)

*Jet-Driven Rotors (Cont.)*

LAMINAR NATURAL-CONVECTION FLOW AND HEAT TRANSFER OF FLUIDS WITH AND WITHOUT HEAT SOURCES IN CHANNELS WITH CONSTANT WALL TEMPERATURES. Simon Ostrach. December 1952. 55p. diags. (NACA TN 2863)

LAMINAR NATURAL-CONVECTION FLOW AND HEAT TRANSFER OF FLUIDS WITH AND WITHOUT HEAT SOURCES IN CHANNELS WITH CONSTANT WALL TEMPERATURES. Simon Ostrach. December 1952. 55p. diags. (NACA TN 2863)

**NUCLEAR-ENERGY SYSTEM  
(3.1.10)**

EXPERIMENTAL INVESTIGATION OF FORCED-CONVECTION HEAT-TRANSFER CHARACTERISTICS OF LEAD-BISMUTH EUTECTIC. Bernard Lubarsky. September 1951. 30p. diags., photo., tab. (NACA RM E51G02)

IMPLICATION OF THE TRANSPORT EQUATION FOR THE SEMIEMPIRICAL TREATMENT OF SHIELDS. Philip Schwed. March 1952. 31p. (NACA TN 2647)

LUMPED REFLECTOR PARAMETERS FOR TWO-GROUP REACTOR CALCULATIONS. Daniel Fieno, Harold Schneider and Robert B. Spooner. September 1952. 25p. diags., tab. (NACA RM E52H01)

FORCED-CONVECTION HEAT-TRANSFER CHARACTERISTICS OF MOLTEN SODIUM HYDROXIDE. Milton D. Grele and Louis Gedeon. February 1953. 27p. diags., photo., 2 tabs. (NACA RM E52L09)

**COMPARISON  
OF ENGINE TYPES  
(3.1.12)**

METHOD AND GRAPHS FOR THE EVALUATION OF AIR-INDUCTION SYSTEMS. George B. Brajnikoff. April 1952. 41p. diags., tab. (NACA TN 2697)

## Control of Engines

### (3.2)

**AUTOMATIC CONTROL SYSTEMS SATISFYING CERTAIN GENERAL CRITERIONS ON TRANSIENT BEHAVIOR.** Aaron S. Boksenbom and Richard Hood. 1952. ii, 13p. diags. (NACA Rep. 1068. Formerly TN 2378)

**EXPERIMENTAL DETERMINATION OF TIME CONSTANTS AND NUSSELT NUMBERS FOR BARE-WIRE THERMOCOUPLES IN HIGH-VELOCITY AIR STREAMS AND ANALYTIC APPROXIMATION OF CONDUCTION AND RADIATION ERRORS.** Marvin D. Scadron and Isidore Warshawsky. January 1952. 81p. diags., 4 tabs. (NACA TN 2599)

**ELECTRICAL TECHNIQUES FOR COMPENSATION OF THERMAL TIME LAG OF THERMOCOUPLES AND RESISTANCE THERMOMETER ELEMENTS.** Charles E. Shepard and Isidore Warshawsky. May 1952. ii, 85p. diags., photos., 9 tabs. (NACA TN 2703)

**DYNAMICS OF MECHANICAL FEEDBACK-TYPE HYDRAULIC SERVOMOTORS UNDER INERTIA LOADS.** Harold Gold, Edward W. Otto and Victor L. Ransom. August 1952. 63p. diags., photos. (NACA TN 2767)

**OPTIMUM CONTROLLERS FOR LINEAR CLOSED-LOOP SYSTEMS.** Aaron S. Boksenbom, David Novik and Herbert Heppler. April 1953. 27p. diags. (NACA TN 2939)

## CONTROL OF TURBOJET ENGINES

### (3.2.2)

**DYNAMICS OF A TURBOJET ENGINE CONSIDERED AS A QUASI-STATIC SYSTEM.** Edward W. Otto and Burt L. Taylor, III. 1951. ii, 12p. diags. (NACA Rept. 1011. Formerly TN 2091)

**EVALUATION OF THREE METHODS FOR DETERMINING DYNAMIC CHARACTERISTICS OF A TURBOJET ENGINE.** Gene J. Delio. February 1952. 56p. diags., 6 tabs. (NACA TN 2634)

**APPLICATION OF LINEAR ANALYSIS TO AN EXPERIMENTAL INVESTIGATION OF A TURBOJET ENGINE WITH PROPORTIONAL SPEED CONTROL.** Marcel Dandois and David Novik. February 1952. 38p. diags., photos. (NACA TN 2642)

## TURBINE-PROPELLER ENGINES

### (3.2.4)

**INVESTIGATION OF FREQUENCY-RESPONSE CHARACTERISTICS OF ENGINE SPEED FOR A TYPICAL TURBINE-PROPELLER ENGINE.** Burt L. Taylor, III and Frank L. Oppenheimer. 1951. 11p. diags., 2 tabs. (NACA Rept. 1017. Formerly TN 2184)

**METHOD OF MATCHING COMPONENTS AND PREDICTING PERFORMANCE OF A TURBINE-PROPELLER ENGINE.** Alois T. Sutor and Morris A. Zipkin. September 1951. 75p. diags. (NACA TN 2450)

## Auxiliary Booster Systems

### (3.3)

FLIGHT INVESTIGATION OF THRUST AUGMENTATION OF A TURBOJET ENGINE BY WATER-ALCOHOL INJECTION. Carl Ellisman. September 29, 1947. 20p. diags., photos. (NACA RM E7G29) (Declassified from Restricted, 6/5/53)

### GAS TURBINES

#### (3.3.2)

FLIGHT INVESTIGATION OF THRUST AUGMENTATION OF A TURBOJET ENGINE BY WATER-ALCOHOL INJECTION. Carl Ellisman. September 29, 1947. 20p. diags., photos. (NACA RM E7G29) (Declassified from Restricted, 6/5/53)

#### LIQUID INJECTION

##### (3.3.2.1)

INVESTIGATION OF THRUST AUGMENTATION OF A 1600-POUND THRUST CENTRIFUGAL-FLOW-TYPE TURBOJET ENGINE BY INJECTION OF REFRIGERANTS AT COMPRESSOR INLETS. William L. Jones and Harry W. Dowman. August 25, 1947. 44p. diags., photo., tab. (NACA RM E7G23) (Declassified from Restricted, 6/5/53)

ANALYSIS OF THRUST AUGMENTATION OF TURBOJET ENGINES BY WATER INJECTION AT COMPRESSOR INLET INCLUDING CHARTS FOR CALCULATING COMPRESSION PROCESSES WITH WATER INJECTION. E. Clinton Wilcox and Arthur M. Trout. 1951. ii, 20p. diags. (NACA Rept. 1006. Formerly TN 2104; TN 2105)

THEORETICAL AUGMENTATION OF TURBINE-PROPELLER ENGINE BY COMPRESSOR-INLET WATER INJECTION, TAIL-PIPE BURNING, AND THEIR COMBINATION. Reece V. Hensley. March 1952. 43p. diags. (NACA TN 2672)

THEORETICAL PERFORMANCE OF AN AXIAL-FLOW COMPRESSOR IN A GAS-TURBINE ENGINE OPERATING WITH INLET WATER INJECTION. Reece V. Hensley. March 1952. 25p. diags. (NACA TN 2673)

#### AFTERBURNING

##### (3.3.2.2)

EXPERIMENTAL STUDY OF ISOTHERMAL WAKE-FLOW CHARACTERISTICS OF VARIOUS FLAME-HOLDER SHAPES. George G. Younger, David S. Gabriel and William R. Mickelsen. January 1952. 45p. diags., photos., 2 tabs. (NACA RM E51K07)

THEORETICAL AUGMENTATION OF TURBINE-PROPELLER ENGINE BY COMPRESSOR-INLET WATER INJECTION, TAIL-PIPE BURNING, AND THEIR COMBINATION. Reece V. Hensley. March 1952. 43p. diags. (NACA TN 2672)

#### BLEEDOFF

##### (3.3.2.3)

EFFECT OF COMPRESSOR-OUTLET AIR BLEED ON PERFORMANCE OF A CENTRIFUGAL-FLOW TURBOJET ENGINE WITH A CONSTANT-AREA JET NOZZLE. Sidney C. Huntley. June 1952. 20p. diags. (NACA TN 2713)

ICING PROTECTION FOR A TURBOJET TRANSPORT AIRPLANE: HEATING REQUIREMENTS, METHODS OF PROTECTION, AND PERFORMANCE PENALTIES. Thomas F. Gelder, James P. Lewis and Stanley L. Koutz. January 1953. i, 57p. diags., tab. (NACA TN 2866)



## Fuels

### (3.4)

VARIATION IN SMOKING TENDENCY AMONG LOW MOLECULAR WEIGHT HYDROCARBONS. Rose L. Schalla and Glen E. McDonald. December 1952. 16p. diagrs., 3 tabs. (NACA RM E52I22)

### PREPARATION

#### (3.4.1)

SYNTHESIS OF CYCLOPROPANE HYDROCARBONS FROM METHYLCYCLOPROPYL KETONE. III - 2-CYCLOPROPYL-1-BUTENE, CIS AND TRANS 2-CYCLOPROPYL-2-BUTENE, AND 2-CYCLOPROPYLBUTANE. Vernon A. Slabey and Paul H. Wise. June 1951. 22p. diagrs., tab. (NACA TN 2398)

SYNTHESIS, PURIFICATION, AND PHYSICAL PROPERTIES OF HYDROCARBONS OF THE NAPHTHALENE SERIES. I - 1-METHYLNAPHTHALENE, 1-ETHYLNAPHTHALENE, 1-BUTYLNAPHTHALENE, AND 1-ISOBUTYLNAPHTHALENE. Harold F. Hipsher and Paul H. Wise. August 1951. 19p. diagrs., tab. (NACA TN 2430)

### PHYSICAL AND CHEMICAL PROPERTIES

#### (3.4.2)

CORRELATION OF PHYSICAL PROPERTIES WITH MOLECULAR STRUCTURE FOR SOME DICYCLIC HYDROCARBONS HAVING HIGH THERMAL-ENERGY RELEASE PER UNIT VOLUME. P. H. Wise, K. T. Serijan and I. A. Goodman. 1951. ii, 10p. diagrs., 3 tabs. (NACA Rept. 1003. Formerly TN 2081)

GENERAL METHOD AND THERMODYNAMIC TABLES FOR COMPUTATION OF EQUILIBRIUM COMPOSITION AND TEMPERATURE OF CHEMICAL REACTIONS. Vearl N. Huff, Sanford Gordon and Virginia E. Morrell. 1951. ii, 57p., 45 tabs. (NACA Rept. 1037. Formerly NACA TN 2113, TN 2161)

EFFECT OF FUEL IMMERSION ON LAMINATED PLASTICS. W. A. Crouse, Margie Carickhoff and Margaret A. Fisher, National Bureau of Standards. June 1951. 34p. diagrs., photos., 9 tabs. (NACA TN 2377)

SYNTHESIS OF CYCLOPROPANE HYDROCARBONS FROM METHYLCYCLOPROPYL KETONE. III - 2-CYCLOPROPYL-1-BUTENE, CIS AND TRANS 2-CYCLOPROPYL-2-BUTENE, AND 2-CYCLOPROPYLBUTANE. Vernon A. Slabey and Paul H. Wise. June 1951. 22p. diagrs., tab. (NACA TN 2398)

SYNTHESIS, PURIFICATION, AND PHYSICAL PROPERTIES OF HYDROCARBONS OF THE NAPHTHALENE SERIES. I - 1-METHYLNAPHTHALENE, 1-ETHYLNAPHTHALENE, 1-BUTYLNAPHTHALENE, AND 1-ISOBUTYLNAPHTHALENE. Harold F. Hipsher and Paul H. Wise. August 1951. 19p. diagrs., tab. (NACA TN 2430)

FLAME VELOCITIES OVER A WIDE COMPOSITION RANGE FOR PENTANE-AIR, ETHYLENE-AIR, AND PROPYNE-AIR FLAMES. Dorothy M. Simon and Edgar L. Wong. October 1951. 40p. diagrs., photos., 4 tabs. (NACA RM E51H09)

INFRARED SPECTRA OF 59 DICYCLIC HYDROCARBONS. K. T. Serijan, I. A. Goodman and W. J. Yankauskas. November 1951. 37p. diagrs., 4 tabs. (NACA TN 2557)

AN ANALYSIS OF AN X-RAY ABSORPTION METHOD FOR MEASUREMENT OF HIGH GAS TEMPERATURES. Ruth N. Weltmann and Perry W. Kuhns. December 1951. 35p. diagrs., photos., 2 tabs. (NACA TN 2580)

VARIATION OF THE PRESSURE LIMITS OF FLAME PROPAGATION WITH TUBE DIAMETER FOR PROPANE-AIR MIXTURES. Frank E. Belles and Dorothy M. Simon. December 1951. 17p. diagrs., tab. (NACA RM E51J09)

EFFECT OF INITIAL MIXTURE TEMPERATURE ON FLAME SPEED OF METHANE-AIR, PROPANE-AIR AND ETHYLENE-AIR MIXTURES. Gordon L. Dugger. 1952. ii, 12p. diagrs., photo., 3 tabs. (NACA Rept. 1061. Formerly TN 2170; TN 2374)

CORRELATION OF PHYSICAL PROPERTIES WITH MOLECULAR STRUCTURE FOR SOME DICYCLIC HYDROCARBONS HAVING HIGH THERMAL-ENERGY RELEASE PER UNIT VOLUME - 2-ALKYLBIPHENYL AND THE TWO ISOMERIC 2-ALKYLBICYCLOHEXYL SERIES. Irving A. Goodman and Paul H. Wise. 1952. 10p. diagrs., 2 tabs. (NACA Rept. 1065. Formerly TN 2419)

FLAME SPEEDS OF METHANE-AIR, PROPANE-AIR, AND ETHYLENE-AIR MIXTURES AT LOW INITIAL TEMPERATURES. Gordon L. Dugger and Sheldon Heimel. February 1952. 25p. diagrs., tab. (NACA TN 2624)

AN ACTIVE PARTICLE DIFFUSION THEORY OF FLAME QUENCHING FOR LAMINAR FLAMES. Dorothy M. Simon and Frank E. Belles. March 1952. 24p. diagrs., 3 tabs. (NACA RM E51L18)

VARIATION OF PRESSURE LIMITS OF FLAME PROPAGATION WITH TUBE DIAMETER FOR VARIOUS ISOCTANE-OXYGEN-NITROGEN MIXTURES. Adolph E. Spakowski and Frank E. Belles. March 1952. 20p. diagrs. (NACA RM E52A08)

*Physical and Chemical Properties (Cont.)*

FLAME SPEEDS OF 2,2,4-TRIMETHYLPENTANE-OXYGEN-NITROGEN MIXTURES. Gordon L. Dugger and Dorothy D. Graab. April 1952. 25p. diags., photo., 2 tabs. (NACA TN 2680)

SOLUBILITY OF WATER IN HYDROCARBONS. R. R. Hibbard and R. L. Schalla. July 1952. 25p. diags., 3 tabs. (NACA RM E52D24)

MINIMUM IGNITION ENERGIES OF SIX PURE HYDROCARBON FUELS OF THE C<sub>2</sub> AND C<sub>6</sub> SERIES. Allen J. Metzler. August 1952. 22p. diags., 3 tabs. (NACA RM E52F27)

EFFECT OF FREE METHYL RADICALS ON SLOW OXIDATION OF PROPANE AND ETHANE. Glen E. McDonald and Rose L. Schalla. August 1952. 21p. diags., 4 tabs. (NACA RM E52G17)

PRESSURE LIMITS OF FLAME PROPAGATION OF PURE HYDROCARBON-AIR MIXTURES AT REDUCED PRESSURES. Adolph E. Spakowski. September 1952. 35p. diags., 2 tabs. (NACA RM E52H15)

CALORIMETRIC DETERMINATION OF CONSTANT-PRESSURE SPECIFIC HEATS OF CARBON DIOXIDE AT ELEVATED PRESSURES AND TEMPERATURES. Virgil E. Schrock, University of California. December 1952. 46p. diags., 2 tabs. (NACA TN 2838)

PREDICTION OF FLAME VELOCITIES OF HYDROCARBON FLAMES. Gordon L. Dugger and Dorothy M. Simon. January 1953. 23p. diags., 3 tabs. (NACA RM E52J13)

FLAME VELOCITIES OF PROPANE- AND ETHYLENE-OXYGEN-NITROGEN MIXTURES. Gordon L. Dugger and Dorothy D. Graab. January 1953. 23p. diags., 3 tabs. (NACA RM E52J24)

**RELATION TO ENGINE  
PERFORMANCE  
(3.4.3)**

**RECIPROCATING ENGINES  
(3.4.3.1)**

NACA INVESTIGATION OF FUEL PERFORMANCE IN PISTON-TYPE ENGINES. Henry C. Barnett. 1951. vi, 102p. diags., photos., 32 tabs. (NACA Rept. 1026)

**TURBINE ENGINES,  
RAM JETS, AND PULSE JETS  
(3.4.3.2)**

EFFECT OF RADIANT ENERGY ON VAPORIZATION AND COMBUSTION OF LIQUID FUELS. A. L. Berlad and R. R. Hibbard. November 1952. 46p. diags., 2 tabs. (NACA RM E52I09)

VARIATION IN SMOKING TENDENCY AMONG LOW MOLECULAR WEIGHT HYDROCARBONS. Rose L. Schalla and Glen E. McDonald. December 1952. 16p. diags., 3 tabs. (NACA RM E52I22)

**ROCKETS  
(INCLUDES FUEL AND OXIDANT)  
(3.4.3.3)**

PRELIMINARY INVESTIGATION OF HYDRAZINE AS A ROCKET FUEL. Paul M. Ordin, Riley O. Miller and John M. Diehl. May 24, 1948. 35p. diags., photos. (NACA RM ETH21) (Declassified from Confidential, 9/16/52)

PHOTOGRAPHIC STUDY OF COMBUSTION IN A ROCKET ENGINE. I - VARIATION IN COMBUSTION OF LIQUID OXYGEN AND GASOLINE WITH SEVEN METHODS OF PROPELLANT INJECTION. Donald R. Bellman and Jack C. Humphrey. August 26, 1948. 51p. photos., diags., tab. (NACA RM E8F01) (Declassified from Restricted, 1/3/52)

GENERAL METHOD AND THERMODYNAMIC TABLES FOR COMPUTATION OF EQUILIBRIUM COMPOSITION AND TEMPERATURE OF CHEMICAL REACTIONS. Vearl N. Huff, Sanford Gordon and Virginia E. Morrell. 1951. ii, 57p., 45 tabs. (NACA Rept. 1037. Formerly NACA TN 2113, TN 2161)

DESIGN OF APPARATUS FOR DETERMINING HEAT TRANSFER AND FRICTIONAL PRESSURE DROP OF NITRIC ACID FLOWING THROUGH A HEATED TUBE. Bruce A. Reese and Robert W. Graham, Purdue University. June 1952. 61p. diags., photos., tab. (NACA RM 52D03)

## Combustion and Combustors

### (3.5)

**VARIATION OF THE PRESSURE LIMITS OF FLAME PROPAGATION WITH TUBE DIAMETER FOR PROPANE-AIR MIXTURES.** Frank E. Belles and Dorothy M. Simon. December 1951. 17p. diagrs., tab. (NACA RM E51J09)

**VARIATION OF PRESSURE LIMITS OF FLAME PROPAGATION WITH TUBE DIAMETER FOR VARIOUS ISOCTANE-OXYGEN-NITROGEN MIXTURES.** Adolph E. Spakowski and Frank E. Belles. March 1952. 20p. diagrs. (NACA RM E52A08)

**PRESSURE LIMITS OF FLAME PROPAGATION OF PURE HYDROCARBON-AIR MIXTURES AT REDUCED PRESSURES.** Adolph E. Spakowski. September 1952. 35p. diagrs., 2 tabs. (NACA RM E52H15)

**COMBUSTION INSTABILITY IN AN ACID-HEPTANE ROCKET WITH A PRESSURIZED-GAS PROPELLANT PUMPING SYSTEM.** Adelbert O. Tischler and Donald R. Bellman. May 1953. 50p. diagrs., photo. (NACA TN 2936. Formerly RM E51G11)

## GENERAL COMBUSTION

### RESEARCH

#### (3.5.1)

**GENERAL METHOD AND THERMODYNAMIC TABLES FOR COMPUTATION OF EQUILIBRIUM COMPOSITION AND TEMPERATURE OF CHEMICAL REACTIONS.** Vearl N. Huff, Sanford Gordon and Virginia E. Morrell. 1951. ii, 57p., 45 tabs. (NACA Rept. 1037. Formerly NACA TN 2113, TN 2161)

**COMBUSTION OF SMOKE IN DIFFUSION AND BUNSEN FLAMES.** Thomas P. Clark. August 1951. 13p. diagrs., photos. (NACA RM E51E15)

**FLAME VELOCITIES OVER A WIDE COMPOSITION RANGE FOR PENTANE-AIR, ETHYLENE-AIR, AND PROPYNE-AIR FLAMES.** Dorothy M. Simon and Edgar L. Wong. October 1951. 40p. diagrs., photos., 4 tabs. (NACA RM E51H09)

**DETERMINATION OF RAM-JET COMBUSTION-CHAMBER TEMPERATURES BY MEANS OF TOTAL-PRESSURE SURVEYS.** I. Irving Pinkel. December 1951. 10p. diagrs., tab. (NACA TN 2526. Formerly RM E7C03)

**FUNDAMENTAL FLAME VELOCITIES OF PURE HYDROCARBONS. III - EXTENSION OF TUBE METHOD TO HIGH FLAME VELOCITIES - ACETYLENE-AIR MIXTURES.** Oscar Levine and Melvin Gerstein. December 1951. 21p. diagrs. (NACA RM E51J05)

**VARIATION OF THE PRESSURE LIMITS OF FLAME PROPAGATION WITH TUBE DIAMETER FOR PROPANE-AIR MIXTURES.** Frank E. Belles and Dorothy M. Simon. December 1951. 17p. diagrs., tab. (NACA RM E51J09)

**INVESTIGATION OF HYDROCARBON IGNITION.** Charles E. Frank and Angus U. Blackham, University of Cincinnati. January 1952. 33p. diagrs., 5 tabs. (NACA TN 2549)

**AN ACTIVE PARTICLE DIFFUSION THEORY OF FLAME QUENCHING FOR LAMINAR FLAMES.** Dorothy M. Simon and Frank E. Belles. March 1952. 24p. diagrs., 3 tabs. (NACA RM E51L18)

**VARIATION OF PRESSURE LIMITS OF FLAME PROPAGATION WITH TUBE DIAMETER FOR VARIOUS ISOCTANE-OXYGEN-NITROGEN MIXTURES.** Adolph E. Spakowski and Frank E. Belles. March 1952. 20p. diagrs. (NACA RM E52A08)

**FLAME SPEEDS OF 2, 2, 4-TRIMETHYLPENTANE-OXYGEN-NITROGEN MIXTURES.** Gordon L. Dugger and Dorothy D. Graab. April 1952. 25p. diagrs., photo., 2 tabs. (NACA TN 2680)

**ELECTRICAL TECHNIQUES FOR COMPENSATION OF THERMAL TIME LAG OF THERMOCOUPLES AND RESISTANCE THERMOMETER ELEMENTS.** Charles E. Shepard and Isidore Warshawsky. May 1952. ii, 85p. diagrs., photos., 9 tabs. (NACA TN 2703)

**DRIVING STANDING WAVES BY HEAT ADDITION.** Perry L. Blackshear, Jr. August 1952. 46p. diagrs., photos. (NACA TN 2772)

**INFLUENCE OF EXTERNAL VARIABLES ON SMOKING OF BENZENE FLAMES.** Thomas P. Clark. August 1952. 17p. diagrs. (NACA RM E52G24)

**USE OF A CONSOLIDATED POROUS MEDIUM FOR MEASUREMENT OF FLOW RATE AND VISCOSITY OF GASES AT ELEVATED PRESSURES AND TEMPERATURES.** Martin B. Biles and J. A. Putnam, University of California. September 1952. 51p. diagrs., photos., 7 tabs. (NACA TN 2783)

**PRESSURE LIMITS OF FLAME PROPAGATION OF PURE HYDROCARBON-AIR MIXTURES AT REDUCED PRESSURES.** Adolph E. Spakowski. September 1952. 35p. diagrs., 2 tabs. (NACA RM E52H15)

**EFFECT OF RADIANT ENERGY ON VAPORIZATION AND COMBUSTION OF LIQUID FUELS.** A. L. Berlad and R. R. Hibbard. November 1952. 46p. diagrs., 2 tabs. (NACA RM E52I09)

**EXAMINATION OF SMOKE AND CARBON FROM TURBOJET-ENGINE COMBUSTORS.** Thomas P. Clark. November 1952. 12p. photos., 2 tabs. (NACA RM E52I26)

*General Combustion Research*  
(Cont.)

CALORIMETRIC DETERMINATION OF CONSTANT-PRESSURE SPECIFIC HEATS OF CARBON DIOXIDE AT ELEVATED PRESSURES AND TEMPERATURES. Virgil E. Schrock, University of California. December 1952. 46p. diagrs., 2 tabs. (NACA TN 2838)

INVESTIGATION OF SPONTANEOUS IGNITION TEMPERATURES OF ORGANIC COMPOUNDS WITH PARTICULAR EMPHASIS ON LUBRICANTS. Charles E. Frank, Angus U. Blackham and Donald E. Swarts, University of Cincinnati. December 1952. 40p. diagrs., 6 tabs. (NACA TN 2848)

VARIATION IN SMOKING TENDENCY AMONG LOW MOLECULAR WEIGHT HYDROCARBONS. Rose L. Schalla and Glen E. McDonald. December 1952. 16p. diagrs., 3 tabs. (NACA RM E52I22)

PREDICTION OF FLAME VELOCITIES OF HYDRO-CARBON FLAMES. Gordon L. Dugger and Dorothy M. Simon. January 1953. 23p. diagrs., 3 tabs. (NACA RM E52J13)

FLAME VELOCITIES OF PROPANE- AND ETHYLENE-OXYGEN-NITROGEN MIXTURES. Gordon L. Dugger and Dorothy D. Graab. January 1953. 23p. diagrs., 3 tabs. (NACA RM E52J24)

LAMINAR-FLOW  
COMBUSTION  
(3.5.1.1)

ON THE THEORY OF COMBUSTION OF INITIALLY UNMIXED GASES. (K Teorii Gorenia Neperemeshannykh Gazov). Y. B. Zeldovich. June 1951. 20p. diagrs. (NACA TM 1296. Trans. from Zhurnal Tekhnicheskoi Fiziki, v.19, no.10, Oct. 1949, p.1199-1210).

THEORY OF FLAME PROPAGATION. (K Teorii Rasprostraneniya Plameni). Y. B. Zeldovich. June 1951. 39p. diagrs. (NACA TM 1282. Trans. from Zhurnal Fizicheskoi Khimii, v.22, 1948, p.27-49).

COMBUSTION OF SMOKE IN DIFFUSION AND BUNSEN FLAMES. Thomas P. Clark. August 1951. 13p. diagrs., photos. (NACA RM E51E15)

EFFECT OF INITIAL MIXTURE TEMPERATURE ON FLAME SPEED OF METHANE-AIR, PROPANE-AIR AND ETHYLENE-AIR MIXTURES. Gordon L. Dugger. 1952. ii, 12p. diagrs., photo., 3 tabs. (NACA Rept. 1061. Formerly TN 2170; TN 2374)

FLAME SPEEDS OF METHANE-AIR, PROPANE-AIR, AND ETHYLENE-AIR MIXTURES AT LOW INITIAL TEMPERATURES. Gordon L. Dugger and Sheldon Heimel. February 1952. 25p. diagrs., tab. (NACA TN 2624)

FLAME SPEEDS OF 2, 2, 4-TRIMETHYLPENTANE-OXYGEN-NITROGEN MIXTURES. Gordon L. Dugger and Dorothy D. Graab. April 1952. 25p. diagrs., photo., 2 tabs. (NACA TN 2680)

INFLUENCE OF EXTERNAL VARIABLES ON SMOKING OF BENZENE FLAMES. Thomas P. Clark. August 1952. 17p. diagrs. (NACA RM E52G24)

EXAMINATION OF SMOKE AND CARBON FROM TURBOJET-ENGINE COMBUSTORS. Thomas P. Clark. November 1952. 12p. photos., 2 tabs. (NACA RM E52I26)

PREDICTION OF FLAME VELOCITIES OF HYDRO-CARBON FLAMES. Gordon L. Dugger and Dorothy M. Simon. January 1953. 23p. diagrs., 3 tabs. (NACA RM E52J13)

FLAME VELOCITIES OF PROPANE- AND ETHYLENE-OXYGEN-NITROGEN MIXTURES. Gordon L. Dugger and Dorothy D. Graab. January 1953. 23p. diagrs., 3 tabs. (NACA RM E52J24)

TURBULENT-FLOW  
COMBUSTION  
(3.5.1.2)

EFFECT OF INITIAL MIXTURE TEMPERATURE ON FLAME SPEED OF METHANE-AIR, PROPANE-AIR AND ETHYLENE-AIR MIXTURES. Gordon L. Dugger. 1952. ii, 12p. diagrs., photo., 3 tabs. (NACA Rept. 1061. Formerly TN 2170; TN 2374)

INFLUENCE OF EXTERNAL VARIABLES ON SMOKING OF BENZENE FLAMES. Thomas P. Clark. August 1952. 17p. diagrs. (NACA RM E52G24)

EXAMINATION OF SMOKE AND CARBON FROM TURBOJET-ENGINE COMBUSTORS. Thomas P. Clark. November 1952. 12p. photos., 2 tabs. (NACA RM E52I26)

AUXILIARY EQUIPMENT AND TECHNIQUES FOR ADAPTING THE CONSTANT-TEMPERATURE HOT-WIRE ANEMOMETER TO SPECIFIC PROBLEMS IN AIR-FLOW MEASUREMENTS. James C. Laurence and L. Gene Landes. December 1952. ii, 77p. diagrs., photos., 3 tabs. (NACA TN 2843)

EFFECTS OF FUEL ATOMIZATION  
(3.5.1.4)

PHOTOGRAPHIC STUDY OF COMBUSTION IN A ROCKET ENGINE. I.- VARIATION IN COMBUSTION OF LIQUID OXYGEN AND GASOLINE WITH SEVEN METHODS OF PROPELLANT INJECTION. Donald R. Bellman and Jack C. Humphrey. August 26, 1948. 51p. photos., diagrs., tab. (NACA RM E8F01) (Declassified from Restricted, 1/3/52)

EXAMINATION OF SMOKE AND CARBON FROM TURBOJET-ENGINE COMBUSTORS. Thomas P. Clark. November 1952. 12p. photos., 2 tabs. (NACA RM E52I26)

REACTION MECHANISMS  
(3.5.1.5)

FLAME VELOCITIES OVER A WIDE COMPOSITION RANGE FOR PENTANE-AIR, ETHYLENE-AIR, AND PROPYNE-AIR FLAMES. Dorothy M. Simon and Edgar L. Wong. October 1951. 40p. diagrs., photos., 4 tabs. (NACA RM E51H09)

INVESTIGATION OF HYDROCARBON IGNITION. Charles E. Frank and Angus U. Blackham, University of Cincinnati. January 1952. 33p. diagrs., 5 tabs. (NACA TN 2549)

*Reaction Mechanisms (Cont.)*

FLAME SPEEDS OF METHANE-AIR, PROPANE-AIR, AND ETHYLENE-AIR MIXTURES AT LOW INITIAL TEMPERATURES. Gordon L. Dugger and Sheldon Heimel. February 1952. 25p. diags., tab. (NACA TN 2624)

AN ACTIVE PARTICLE DIFFUSION THEORY OF FLAME QUENCHING FOR LAMINAR FLAMES. Dorothy M. Simon and Frank E. Belles. March 1952. 24p. diags., 3 tabs. (NACA RM E51L18)

EFFECT OF FREE METHYL RADICALS ON SLOW OXIDATION OF PROPANE AND ETHANE. Glen E. McDonald and Rose L. Schalla. August 1952. 21p. diags., 4 tabs. (NACA RM E52G17)

EXAMINATION OF SMOKE AND CARBON FROM TURBOJET-ENGINE COMBUSTORS. Thomas P. Clark. November 1952. 12p. photos., 2 tabs. (NACA RM E52I26)

IGNITION OF GASES  
(3.5.1.6)

RELATION BETWEEN INFLAMMABLES AND IGNITION SOURCES IN AIRCRAFT ENVIRONMENTS. Wilfred E. Scull. 1951. iii, 38p. diags., 6 tabs. (NACA Rept. 1019. Formerly NACA TN 2227)

ON THE THEORY OF COMBUSTION OF INITIALLY UNMIXED GASES. (K Teorii Gorenia Neperemeshannykh Gazov). Y. B. Zeldovich. June 1951. 20p. diags. (NACA TM 1296. Trans. from Zhurnal Tekhnicheskoi Fiziki, v.19, no.10, Oct. 1949, p.1199-1210).

SPARK IGNITION OF FLOWING GASES. II - EFFECT OF ELECTRODE PARAMETERS ON ENERGY REQUIRED TO IGNITE A PROPANE-AIR MIXTURE. Clyde C. Swett, Jr. December 1951. 26p. diags., photos. (NACA RM E51J12)

MINIMUM IGNITION ENERGIES OF SIX PURE HYDROCARBON FUELS OF THE C<sub>2</sub> AND C<sub>6</sub> SERIES. Allen J. Metzler. August 1952. 22p. diags., 3 tabs. (NACA RM E52F27)

SPARK IGNITION OF FLOWING GASES. III - EFFECT OF TURBULENCE PROMOTER ON ENERGY REQUIRED TO IGNITE A PROPANE-AIR MIXTURE. Clyde C. Swett, Jr. and Richard H. Donlon. January 1953. 7p. diags. (NACA RM E52J28)

EFFECT OF ENGINE  
OPERATING CONDITIONS  
& COMBUSTION CHAMBER  
GEOMETRY  
(3.5.2)

COMBUSTION INSTABILITY IN AN ACID-HEPTANE ROCKET WITH A PRESSURIZED-GAS PROPELLANT PUMPING SYSTEM. Adelbert O. Tischler and Donald R. Bellman. May 1953. 50p. diags., photo. (NACA TN 2936. Formerly RM E51G11)

RECIPROCATING ENGINES  
(3.5.2.1)

NACA INVESTIGATION OF FUEL PERFORMANCE IN PISTON-TYPE ENGINES. Henry C. Barnett. 1951. vi, 102p. diags., photos., 32 tabs. (NACA Rept. 1026)

TURBINE ENGINES  
(3.5.2.2)

A COMPARISON OF THE SIMULATED-ALTITUDE PERFORMANCE OF TWO TURBOJET COMBUSTOR TYPES. Ray E. Bolz, Thomas T. Schroeter and Eugene V. Zettle. October 7, 1948. 34p. diags. (NACA RM E7I25) (Declassified from Restricted, 6/11/53)

EXAMINATION OF SMOKE AND CARBON FROM TURBOJET-ENGINE COMBUSTORS. Thomas P. Clark. November 1952. 12p. photos., 2 tabs. (NACA RM E52I26)

RAM-JET ENGINES  
(3.5.2.3)

EFFECT OF RAM-JET PRESSURE PULSATIONS ON SUPERSONIC-DIFFUSER PERFORMANCE. James F. Connors. November 20, 1950. 29p. photos., diags. (NACA RM E50H22) (Declassified from Confidential, 6/11/53)

*Ram-Jet Engines (Cont.)*

DETERMINATION OF RAM-JET COMBUSTION-CHAMBER TEMPERATURES BY MEANS OF TOTAL-PRESSURE SURVEYS. I. Irving Pinkel. December 1951. 10p. diags., tab. (NACA TN 2526. Formerly RM E7C03)

EXPERIMENTAL STUDY OF ISOTHERMAL WAKE-FLOW CHARACTERISTICS OF VARIOUS FLAME-HOLDER SHAPES. George G. Younger, David S. Gabriel and William R. Mickelsen. January 1952. 45p. diags., photos., 2 tabs. (NACA RM E51K07)

DRIVING STANDING WAVES BY HEAT ADDITION. Perry L. Blackshear, Jr. August 1952. 46p. diags., photos. (NACA TN 2772)

ROCKET ENGINES  
(3.5.2.5)

PRELIMINARY INVESTIGATION OF HYDRAZINE AS A ROCKET FUEL. Paul M. Ordín, Riley O. Miller and John M. Diehl. May 24, 1948. 35p. diags., photos. (NACA RM E7H21) (Declassified from Confidential, 9/16/52)

PHOTOGRAPHIC STUDY OF COMBUSTION IN A ROCKET ENGINE. I - VARIATION IN COMBUSTION OF LIQUID OXYGEN AND GASOLINE WITH SEVEN METHODS OF PROPELLANT INJECTION. Donald R. Bellman and Jack C. Humphrey. August 26, 1948. 51p. photos., diags., tab. (NACA RM E8F01) (Declassified from Restricted, 1/3/52)

DRIVING STANDING WAVES BY HEAT ADDITION. Perry L. Blackshear, Jr. August 1952. 46p. diags., photos. (NACA TN 2772)

COMBUSTION INSTABILITY IN AN ACID-HEPTANE ROCKET WITH A PRESSURIZED-GAS PROPELLANT PUMPING SYSTEM. Adelbert O. Tischler and Donald R. Bellman. May 1953. 50p. diags., photo. (NACA TN 2936. Formerly RM E51G11)

## Compression and Compressors

### (3.6)

ANALYSIS OF THRUST AUGMENTATION OF TURBOJET ENGINES BY WATER INJECTION AT COMPRESSOR INLET INCLUDING CHARTS FOR CALCULATING COMPRESSION PROCESSES WITH WATER INJECTION. E. Clinton Wilcox and Arthur M. Trout. 1951. ii, 20p. diagrs. (NACA Rept. 1006. Formerly TN 2104; TN 2105)

METHOD OF ANALYSIS FOR COMPRESSIBLE FLOW PAST ARBITRARY TURBOMACHINE BLADES ON GENERAL SURFACE OF REVOLUTION. Chung-Hua Wu and Curtis A. Brown. July 1951. 42p. diagrs. (NACA TN 2407)

### FLOW THEORY AND EXPERIMENT

#### (3.6.1)

PERFORMANCE OF 24-INCH SUPERSONIC AXIAL-FLOW COMPRESSOR IN AIR. II- PERFORMANCE OF COMPRESSOR ROTOR AT EQUIVALENT TIP SPEEDS FROM 800 TO 1765 FEET PER SECOND. Irving A. Johnsen, Linwood C. Wright and Melvin J. Hartmann. January 21, 1949. 31p. diagrs. (NACA RM E8G01) (Declassified from Restricted, 4/13/53)

PERFORMANCE OF SUPERSONIC AXIAL-FLOW COMPRESSORS BASED ON ONE-DIMENSIONAL ANALYSIS. Linwood C. Wright and John F. Klapproth. March 25, 1949. 29p. diagrs. (NACA RM E8L10) (Declassified from Confidential, 3/28/52)

PRELIMINARY ANALYSIS OF AXIAL-FLOW COMPRESSORS HAVING SUPERSONIC VELOCITY AT THE ENTRANCE OF THE STATOR. Antonio Ferri. September 12, 1949. 36p. diagrs. (NACA RM L9G06) (Declassified from Confidential, 4/13/53)

ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF 90° SUPERSONIC TURNING PASSAGES SUITABLE FOR SUPERSONIC COMPRESSORS OR TURBINES. Luke L. Liccini. September 12, 1949. 91p. photos., diagrs., 3 tabs. (NACA RM L9G07) (Declassified from Confidential, 4/13/53)

FLOW THROUGH CASCADES IN TANDEM. William E. Spraglin. June 1951. 44p. diagrs. (NACA TN 2393)

EXPERIMENTAL INVESTIGATION OF FLOW IN THE ROTATING PASSAGES OF A 48-INCH IMPELLER AT LOW TIP SPEEDS. Donald J. Michel, Ambrose Ginsburg and John Mizisin. June 26, 1951. 37p. diagrs., photo., tab. (NACA RM E51D20)

A RAPID APPROXIMATE METHOD FOR DETERMINING VELOCITY DISTRIBUTION ON IMPELLER BLADES OF CENTRIFUGAL COMPRESSORS. John D. Stanitz and Vasily D. Prian. July 1951. 31p. diagrs. (NACA TN 2421)

A METHOD OF DESIGNING TURBOMACHINE BLADES WITH A DESIRABLE THICKNESS DISTRIBUTION FOR COMPRESSIBLE FLOW ALONG AN ARBITRARY STREAM FILAMENT OF REVOLUTION. Chung-Hua Wu and Curtis A. Brown. September 1951. 45p. diagrs., 6 tabs. (NACA TN 2455)

TWO AXIAL-SYMMETRY SOLUTIONS FOR INCOMPRESSIBLE FLOW THROUGH A CENTRIFUGAL COMPRESSOR WITH AND WITHOUT INDUCER VANES. Gaylord O. Ellis, John D. Stanitz and Leonard J. Sheldrake. September 1951. 34p. diagrs. (NACA TN 2464)

CHARACTERISTICS OF A WEDGE WITH VARIOUS HOLDER CONFIGURATIONS FOR STATIC-PRESSURE MEASUREMENTS IN SUBSONIC GAS STREAMS. Clarence C. Gettelman and Lloyd N. Krause. September 1951. 13p. diagrs. (NACA RM E51G09)

ANALYSIS OF AN AXIAL COMPRESSOR STAGE WITH INFINITESIMAL AND FINITE BLADE SPACING. H. J. Reissner and L. Meyerhoff, Polytechnic Institute of Brooklyn. October 1951. 32p. diagrs. (NACA TN 2493)

AN ANALYSIS OF THE FLOW IN THE ROTATING PASSAGE OF LARGE RADIAL-INLET CENTRIFUGAL COMPRESSOR AT A TIP SPEED OF 700 FEET PER SECOND. Vasily D. Prian and Donald J. Michel. December 1951. 46p. diagrs., photo., tab. (NACA TN 2584)

GENERALIZATION OF BOUNDARY-LAYER MOMENTUM-INTEGRAL EQUATIONS TO THREE-DIMENSIONAL FLOWS INCLUDING THOSE OF ROTATING SYSTEM. Artur Mager. 1952. ii, 16p. diagrs. (NACA Rept. 1067. Formerly TN 2310).

AXISYMMETRIC SUPERSONIC FLOW IN ROTATING IMPELLERS. Arthur W. Goldstein. 1952. ii, 14p. diagrs. (NACA Rept. 1083. Formerly TN 2388)

DISCUSSION OF BOUNDARY-LAYER CHARACTERISTICS NEAR THE WALL OF AN AXIAL-FLOW COMPRESSOR. Artur Mager, John J. Mahoney and Ray E. Budinger. 1952. ii, 20p. diagrs., photo., tab. (NACA Rept. 1085. Formerly RM E51H07)

A GENERAL THEORY OF THREE-DIMENSIONAL FLOW IN SUBSONIC AND SUPERSONIC TURBOMACHINES OF AXIAL-, RADIAL-, AND MIXED-FLOW TYPES. Chung-Hua Wu. January 1952. 93p. diagrs., tab. (NACA TN 2604)

TWO-DIMENSIONAL FLOW ON GENERAL SURFACES OF REVOLUTION IN TURBOMACHINES. John D. Stanitz and Gaylord O. Ellis. March 1952. 44p. diagrs., tab. (NACA TN 2654)

THEORETICAL AND EXPERIMENTAL ANALYSIS OF ONE-DIMENSIONAL COMPRESSIBLE FLOW IN A ROTATING RADIAL-INLET IMPELLER CHANNEL. Seymour Lieblein. April 1952. 47p. diagrs., photo. (NACA TN 2691)

*Flow Theory and Experiment*  
(Cont.)

ELECTRICAL TECHNIQUES FOR COMPENSATION OF THERMAL TIME LAG OF THERMOCOUPLES AND RESISTANCE THERMOMETER ELEMENTS. Charles E. Shepard and Isidore Warshawsky. May 1952. ii, 85p. diagrs., photos., 9 tabs. (NACA TN 2703)

EFFECT OF CHANGING PASSAGE CONFIGURATION ON INTERNAL-FLOW CHARACTERISTICS OF A 48-INCH CENTRIFUGAL COMPRESSOR. I - CHANGE IN BLADE SHAPE. Donald J. Michel, John Mizisin and Vasily D. Prian. May 1952. 40p. diagrs., photo., tab. (NACA TN 2706)

AN APPROXIMATE METHOD OF DETERMINING THE SUBSONIC FLOW IN AN ARBITRARY STREAM FILAMENT OF REVOLUTION CUT BY ARBITRARY TURBOMACHINE BLADES. Chung-Hua Wu, Curtis A. Brown and Vasily D. Prian. June 1952. 46p. diagrs., 4 tabs. (NACA TN 2702)

TWO-DIMENSIONAL SHEAR FLOW IN A 90° ELBOW. James J. Kramer and John D. Stanitz. July 1952. 44p. diagrs. (NACA TN 2736)

ANALYSIS OF FLOW IN A SUBSONIC MIXED-FLOW IMPELLER. Chung-Hua Wu, Curtis A. Brown and Eleanor L. Costilow. August 1952. 36p. diagrs. (NACA TN 2749)

SUPERSONIC FLOW WITH WHIRL AND VORTICITY IN AXISYMMETRIC CHANNELS. Ralph J. Eschborn. August 1952. 41p. diagrs. (NACA TN 2768)

COMPARISON OF TWO- AND THREE-DIMENSIONAL POTENTIAL-FLOW SOLUTIONS IN A ROTATING IMPELLER PASSAGE. Gaylord O. Ellis and John D. Stanitz. October 1952. 61p. diagrs. (NACA TN 2806)

INVESTIGATION OF FLOW FLUCTUATIONS AT THE EXIT OF A RADIAL-FLOW CENTRIFUGAL IMPELLER. Joseph T. Hamrick and John Mizisin. October 1952. 20p. diagrs., photo. (NACA RM E52H11)

SEVERAL COMBINATION PROBES FOR SURVEYING STATIC AND TOTAL PRESSURE AND FLOW DIRECTION. Wallace M. Schulze, George C. Ashby, Jr. and John R. Erwin. November 1952. 64p. diagrs., photos., tab. (NACA TN 2830)

EFFECT OF CHANGING PASSAGE CONFIGURATION ON INTERNAL-FLOW CHARACTERISTICS OF A 48-INCH CENTRIFUGAL COMPRESSOR. II - CHANGE IN HUB SHAPE. John Mizisin and Donald J. Michel. November 1952. 35p. diagrs., photo., tab. (NACA TN 2835)

AUXILIARY EQUIPMENT AND TECHNIQUES FOR ADAPTING THE CONSTANT-TEMPERATURE HOT-WIRE ANEMOMETER TO SPECIFIC PROBLEMS IN AIR-FLOW MEASUREMENTS. James C. Laurence and L. Gene Landes. December 1952. ii, 77p. diagrs., photos., 3 tabs. (NACA TN 2843)

**AXIAL FLOW**  
(3.6.1.1)

PERFORMANCE OF 24-INCH SUPERSONIC AXIAL-FLOW COMPRESSOR IN AIR. II- PERFORMANCE OF COMPRESSOR ROTOR AT EQUIVALENT TIP SPEEDS FROM 800 TO 1765 FEET PER SECOND. Irving A. Johnsen, Linwood C. Wright and Melvin J. Hartmann. January 21, 1949. 31p. diagrs. (NACA RM E8G01) (Declassified from Restricted, 4/13/53)

PERFORMANCE OF SUPERSONIC AXIAL-FLOW COMPRESSORS BASED ON ONE-DIMENSIONAL ANALYSIS. Linwood C. Wright and John F. Klapproth. March 25, 1949. 29p. diagrs. (NACA RM E8L10) (Declassified from Confidential, 3/28/52)

INVESTIGATION OF AN IMPULSE AXIAL-FLOW COMPRESSOR. John R. Erwin and Wallace M. Schulze. February 8, 1950. 51p. diagrs., photos. (NACA RM L9J05a) (Declassified from Restricted, 4/13/53)

INVESTIGATION OF AN IMPULSE AXIAL-FLOW COMPRESSOR ROTOR OVER A RANGE OF BLADE ANGLES. Wallace M. Schulze, John R. Erwin and Willard R. Westphal. August 29, 1950. 34p. diagrs., photos. (NACA RM L50F27a) (Declassified from Confidential, 4/13/53)

INVESTIGATION OF A SHROUDED AND AN UNSHROUDED AXIAL-FLOW SUPERSONIC COMPRESSOR. Emanuel Boxer and John R. Erwin. September 15, 1950. 54p. diagrs., photos., tab. (NACA RM L50G05) (Declassified from Confidential, 4/13/53)

EFFECT OF TUNNEL CONFIGURATION AND TESTING TECHNIQUE ON CASCADE PERFORMANCE. John R. Erwin and James C. Emery. 1951. ii, 15p. diagrs., photos. (NACA Rept. 1016. Formerly TN 2028)

APPROXIMATE DESIGN METHOD FOR HIGH-SOLIDITY BLADE ELEMENTS IN COMPRESSORS AND TURBINES. John D. Stanitz. July 1951. 76p. diagrs., 2 tabs. (NACA TN 2408)

EXPRESSIONS FOR MEASURING THE ACCURACY OF APPROXIMATE SOLUTIONS TO COMPRESSIBLE FLOW THROUGH CASCADES OF BLADES WITH EXAMPLES OF USE. John T. Sinnette, Jr., George R. Costello and Robert L. Cummings. October 1951. 33p. diagrs. (NACA TN 2501)

AN ANALYTICAL INVESTIGATION USING AERODYNAMIC LIMITATIONS OF SEVERAL DESIGNS OF HIGH STAGE PRESSURE RATIO MULTISTAGE COMPRESSORS. Charles H. Voit and Arthur R. Thomson. December 1951. 56p. diagrs., 2 tabs. (NACA TN 2589)

A TECHNIQUE APPLICABLE TO THE AERODYNAMIC DESIGN OF INDUCER-TYPE MULTISTAGE AXIAL-FLOW COMPRESSORS. Melvyn Savage and Loren A. Beatty. March 1952. ii, 62p. diagrs., 8 tabs. (NACA TN 2598)



## PROPULSION 120 COMPRESSION AND COMPRESSORS (3.6)

### *Axial Flow Theory and Experiment* (Cont.)

ANALYTICAL INVESTIGATION ON SOME THREE-DIMENSIONAL FLOW PROBLEMS IN TURBO-MACHINES. Frank E. Marble and Irving Michelson, California Institute of Technology. March 1952. 109p. diagrs., 2 tabs. (NACA TN 2614)

EFFECT OF MACH NUMBER ON THE FLOW AND APPLICATION OF COMPRESSIBILITY CORRECTIONS IN A TWO-DIMENSIONAL SUBSONIC-TRANSONIC COMPRESSOR CASCADE HAVING VARIED POROUS-WALL SUCTION AT THE BLADE TIPS. William B. Briggs. March 1952. 43p. diagrs., photos. (NACA TN 2649)

APPLICATION OF A CHANNEL DESIGN METHOD TO HIGH-SOLIDITY CASCADES AND TESTS OF AN IMPULSE CASCADE WITH 90° OF TURNING. John D. Stanitz and Leonard J. Sheldrake. March 1952. 65p. diagrs., photos., 2 tabs. (NACA TN 2652)

THEORETICAL PERFORMANCE OF AN AXIAL-FLOW COMPRESSOR IN A GAS-TURBINE ENGINE OPERATING WITH INLET WATER INJECTION. Reece V. Hensley. March 1952. 25p. diagrs. (NACA TN 2673)

APPLICATION OF SUPERSONIC VORTEX-FLOW THEORY TO THE DESIGN OF SUPERSONIC IMPULSE COMPRESSOR- OR TURBINE-BLADE SECTIONS. Emanuel Boxer, James R. Sterrett and John Wlodarski. April 24, 1952. 70p. diagrs., photos., 4 tabs. (NACA RM L52B06) (Declassified from Confidential, 4/13/53)

MATRIX AND RELAXATION SOLUTIONS THAT DETERMINE SUBSONIC THROUGH FLOW IN AN AXIAL-FLOW GAS TURBINE. Chung-Hua Wu. July 1952. 65p. diagrs., 7 tabs. (NACA TN 2750)

FLOW SURFACES IN ROTATING AXIAL-FLOW PASSAGES. John D. Stanitz and Gaylord O. Ellis. November 1952. 31p. diagrs. (NACA TN 2834)

### RADIAL FLOW (3.6.1.2)

INVESTIGATION OF THRUST AUGMENTATION OF A 1600-POUND THRUST CENTRIFUGAL-FLOW-TYPE TURBOJET ENGINE BY INJECTION OF REFRIGERANTS AT COMPRESSOR INLETS. William L. Jones and Harry W. Dowman. August 25, 1947. 44p. diagrs., photo., tab. (NACA RM E7G23) (Declassified from Restricted, 6/5/53)

EXPERIMENTAL INVESTIGATION OF FLOW IN THE ROTATING PASSAGES OF A 48-INCH IMPELLER AT LOW TIP SPEEDS. Donald J. Michel, Ambrose Ginsburg and John Mizisin. June 26, 1951. 37p. diagrs., photo., tab. (NACA RM E51D20)

APPROXIMATE DESIGN METHOD FOR HIGH-SOLIDITY BLADE ELEMENTS IN COMPRESSORS AND TURBINES. John D. Stanitz. July 1951. 76p. diagrs., 2 tabs. (NACA TN 2408)

A RAPID APPROXIMATE METHOD FOR DETERMINING VELOCITY DISTRIBUTION ON IMPELLER BLADES OF CENTRIFUGAL COMPRESSORS. John D. Stanitz and Vasily D. Prian. July 1951. 31p. diagrs. (NACA TN 2421)

TWO AXIAL-SYMMETRY SOLUTIONS FOR INCOMPRESSIBLE FLOW THROUGH A CENTRIFUGAL COMPRESSOR WITH AND WITHOUT INDUCER VANES. Gaylord O. Ellis, John D. Stanitz and Leonard J. Sheldrake. September 1951. 34p. diagrs. (NACA TN 2464)

AN ANALYSIS OF THE FLOW IN THE ROTATING PASSAGE OF LARGE RADIAL-INLET CENTRIFUGAL COMPRESSOR AT A TIP SPEED OF 700 FEET PER SECOND. Vasily D. Prian and Donald J. Michel. December 1951. 46p. diagrs., photo., tab. (NACA TN 2584)

METHOD OF ANALYSIS FOR COMPRESSIBLE FLOW THROUGH MIXED-FLOW CENTRIFUGAL IMPELLERS OF ARBITRARY DESIGN. Joseph T. Hamrick, Ambrose Ginsburg and Walter M. Osborn. 1952. ii, 10p. diagrs. (NACA Rept. 1082. Formerly NACA TN 2165)

ONE-DIMENSIONAL COMPRESSIBLE FLOW IN VANELESS DIFFUSERS OF RADIAL- AND MIXED-FLOW CENTRIFUGAL COMPRESSORS, INCLUDING EFFECTS OF FRICTION, HEAT TRANSFER AND AREA CHANGE. John D. Stanitz. January 1952. 61p. diagrs., photo. (NACA TN 2610)

THEORETICAL AND EXPERIMENTAL ANALYSIS OF ONE-DIMENSIONAL COMPRESSIBLE FLOW IN A ROTATING RADIAL-INLET IMPELLER CHANNEL. Seymour Lieblein. April 1952. 47p. diagrs., photo. (NACA TN 2691)

EFFECT OF CHANGING PASSAGE CONFIGURATION ON INTERNAL-FLOW CHARACTERISTICS OF A 48-INCH CENTRIFUGAL COMPRESSOR. I - CHANGE IN BLADE SHAPE. Donald J. Michel, John Mizisin and Vasily D. Prian. May 1952. 40p. diagrs., photo., tab. (NACA TN 2706)

COMPARISON OF TWO- AND THREE-DIMENSIONAL POTENTIAL-FLOW SOLUTIONS IN A ROTATING IMPELLER PASSAGE. Gaylord O. Ellis and John D. Stanitz. October 1952. 61p. diagrs. (NACA TN 2806)

INVESTIGATION OF FLOW FLUCTUATIONS AT THE EXIT OF A RADIAL-FLOW CENTRIFUGAL IMPELLER. Joseph T. Hamrick and John Mizisin. October 1952. 20p. diagrs., photo. (NACA RM E52H11)

EFFECT OF CHANGING PASSAGE CONFIGURATION ON INTERNAL-FLOW CHARACTERISTICS OF A 48-INCH CENTRIFUGAL COMPRESSOR. II - CHANGE IN HUB SHAPE. John Mizisin and Donald J. Michel. November 1952. 35p. diagrs., photo., tab. (NACA TN 2835)

### MIXED FLOW (3.6.1.3)

INCREASE IN STABLE-AIR-FLOW OPERATING RANGE OF A MIXED-FLOW COMPRESSOR BY MEANS OF A SURGE INHIBITOR. Eugene B. Laskin and Milton G. Kofskey. April 3, 1947. 21p. diagrs., photos. (NACA RM E7C05) (Reclassified from Restricted, 7/3/51)

PERFORMANCE OF A MIXED-FLOW IMPELLER IN COMBINATION WITH A SEMIVANELESS DIFFUSER. Eugene B. Laskin and Milton G. Kofskey. April 4, 1947. 17p. diagrs., photos. (NACA RM E7C05a) (Reclassified from Restricted, 7/3/51)

EXPERIMENTAL INVESTIGATION OF THE MIXING LOSS BEHIND THE TRAILING EDGE OF A CASCADE OF THREE 90° SUPERSONIC TURNING PASSAGES. Luke L. Liccini. August 15, 1950. 31p. diagrs., photos., tab. (NACA RM L50F21a) (Declassified from Confidential, 4/13/53)

APPROXIMATE DESIGN METHOD FOR HIGH-SOLIDITY BLADE ELEMENTS IN COMPRESSORS AND TURBINES. John D. Stanitz. July 1951. 76p. diagrs., 2 tabs. (NACA TN 2408)

A RAPID APPROXIMATE METHOD FOR DETERMINING VELOCITY DISTRIBUTION ON IMPELLER BLADES OF CENTRIFUGAL COMPRESSORS. John D. Stanitz and Vasily D. Prian. July 1951. 31p. diagrs. (NACA TN 2421)

TWO AXIAL-SYMMETRY SOLUTIONS FOR INCOMPRESSIBLE FLOW THROUGH A CENTRIFUGAL COMPRESSOR WITH AND WITHOUT INDUCER VANES. Gaylord O. Ellis, John D. Stanitz and Leonard J. Sheldrake. September 1951. 34p. diagrs. (NACA TN 2464)

A METHOD OF SOLVING THE DIRECT AND INVERSE PROBLEM OF SUPERSONIC FLOW ALONG ARBITRARY STREAM FILAMENTS OF REVOLUTION IN TURBOMACHINES. Chung-Hua Wu and Eleanor L. Costilow. September 1951. 25p. diagrs. (NACA TN 2492)

METHOD OF ANALYSIS FOR COMPRESSIBLE FLOW THROUGH MIXED-FLOW CENTRIFUGAL IMPELLERS OF ARBITRARY DESIGN. Joseph T. Hamrick, Ambrose Ginsburg and Walter M. Osborn. 1952. ii, 10p. diagrs. (NACA Rept. 1082. Formerly NACA TN 2165)

AXISYMMETRIC SUPERSONIC FLOW IN ROTATING IMPELLERS. Arthur W. Goldstein. 1952. ii, 14p. diagrs. (NACA Rept. 1083. Formerly TN 2388)

ONE-DIMENSIONAL COMPRESSIBLE FLOW IN VANELESS DIFFUSERS OF RADIAL- AND MIXED-FLOW CENTRIFUGAL COMPRESSORS, INCLUDING EFFECTS OF FRICTION, HEAT TRANSFER AND AREA CHANGE. John D. Stanitz. January 1952. 61p. diagrs., photo. (NACA TN 2610)

TWO-DIMENSIONAL FLOW ON GENERAL SURFACES OF REVOLUTION IN TURBOMACHINES. John D. Stanitz and Gaylord O. Ellis. March 1952. 44p. diagrs., tab. (NACA TN 2654)

ANALYSIS OF FLOW IN A SUBSONIC MIXED-FLOW IMPELLER. Chung-Hua Wu, Curtis A. Brown and Eleanor L. Costilow. August 1952. 38p. diagrs. (NACA TN 2749)

COMPARISON OF TWO- AND THREE-DIMENSIONAL POTENTIAL-FLOW SOLUTIONS IN A ROTATING IMPELLER PASSAGE. Gaylord O. Ellis and John D. Stanitz. October 1952. 61p. diagrs. (NACA TN 2806)

## STRESS AND VIBRATION (3.6.2)

ANALYTICAL DETERMINATION OF COUPLED BENDING-TORSION VIBRATIONS OF CANTILEVER BEAMS BY MEANS OF STATION FUNCTIONS. Alexander Mendelson and Selwyn Gendler. 1951. ii, 20p. diagrs., 10 tabs. (NACA Rept. 1005. Formerly TN 2185)

ANALYSIS OF PLANE-PLASTIC-STRESS PROBLEMS WITH AXIAL SYMMETRY IN STRAIN-HARDENING RANGE. M. H. Lee Wu. 1951. ii, 23p. diagrs. (NACA Rept. 1021. Formerly NACA TN 2217)

INFLUENCE OF TENSILE STRENGTH AND DUCTILITY ON STRENGTHS OF ROTATING DISKS IN PRESENCE OF MATERIAL AND FABRICATION DEFECTS OF SEVERAL TYPES. Arthur G. Holms, Joseph E. Jenkins and Andrew J. Repko. June 1951. 39p. diagrs., photos., tab. (NACA TN 2397)

CORRELATION OF TENSILE STRENGTH, TENSILE DUCTILITY, AND NOTCH TENSILE STRENGTH WITH THE STRENGTH OF ROTATING DISKS OF SEVERAL DESIGNS IN THE RANGE OF LOW AND INTERMEDIATE DUCTILITY. Arthur G. Holms and Andrew J. Repko. September 1952. 30p. diagrs., 3 tabs. (NACA TN 2791)

A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE INFLUENCE OF TEMPERATURE GRADIENTS ON THE DEFORMATION AND BURST SPEEDS OF ROTATING DISKS. P. I. Wilterdink, A. G. Holms and S. S. Manson. October 1952. 45p. diagrs., photo., 2 tabs. (NACA TN 2803)

## MATCHING (3.6.3)

METHOD OF MATCHING COMPONENTS AND PREDICTING PERFORMANCE OF A TURBINE-PROPELLER ENGINE. Alois T. Sutor and Morris A. Zipkin. September 1951. 75p. diagrs. (NACA TN 2450)

A THERMODYNAMIC STUDY OF THE TURBINE-PROPELLER ENGINE. Benjamin Pinkel and Irving M. Karp. March 1952. 90p. diagrs. (NACA TN 2653)

## Turbines

### (3.7)

CONSTRUCTION AND USE OF CHARTS IN DESIGN STUDIES OF GAS TURBINES. Sumner Alpert and Rose M. Litrenta. July 1951. 57p. diagrs. (NACA TN 2402)

METHOD OF ANALYSIS FOR COMPRESSIBLE FLOW PAST ARBITRARY TURBOMACHINE BLADES ON GENERAL SURFACE OF REVOLUTION. Chung-Hua Wu and Curtis A. Brown. July 1951. 42p. diagrs. (NACA TN 2407)

### FLOW THEORY AND EXPERIMENT (3.7.1)

ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF 90° SUPERSONIC TURNING PASSAGES SUITABLE FOR SUPERSONIC COMPRESSORS OR TURBINES. Luke L. Liccini. September 12, 1949. 91p. photos., diagrs., 3 tabs. (NACA RM L9G07) (Declassified from Confidential, 4/13/53)

A METHOD OF DESIGNING TURBOMACHINE BLADES WITH A DESIRABLE THICKNESS DISTRIBUTION FOR COMPRESSIBLE FLOW ALONG AN ARBITRARY STREAM FILAMENT OF REVOLUTION. Chung-Hua Wu and Curtis A. Brown. September 1951. 45p. diagrs., 6 tabs. (NACA TN 2455)

ANALYSIS OF AN AXIAL COMPRESSOR STAGE WITH INFINITESIMAL AND FINITE BLADE SPACING. H. J. Reissner and L. Meyerhoff, Polytechnic Institute of Brooklyn. October 1951. 32p. diagrs. (NACA TN 2493)

GENERALIZATION OF BOUNDARY-LAYER MOMENTUM-INTEGRAL EQUATIONS TO THREE-DIMENSIONAL FLOWS INCLUDING THOSE OF ROTATING SYSTEM. Artur Mager. 1952. ii, 16p. diagrs. (NACA Rept. 1067. Formerly TN 2310).

A GENERAL THEORY OF THREE-DIMENSIONAL FLOW IN SUBSONIC AND SUPERSONIC TURBOMACHINES OF AXIAL-, RADIAL-, AND MIXED-FLOW TYPES. Chung-Hua Wu. January 1952. 93p. diagrs., tab. (NACA TN 2604)

TWO-DIMENSIONAL FLOW ON GENERAL SURFACES OF REVOLUTION IN TURBOMACHINES. John D. Stanitz and Gaylord O. Ellis. March 1952. 44p. diagrs., tab. (NACA TN 2654)

AN APPROXIMATE METHOD OF DETERMINING THE SUBSONIC FLOW IN AN ARBITRARY STREAM FILAMENT OF REVOLUTION CUT BY ARBITRARY TURBOMACHINE BLADES. Chung-Hua Wu, Curtis A. Brown and Vasily D. Priyan. June 1952. 46p. diagrs., 4 tabs. (NACA TN 2702)

TWO-DIMENSIONAL SHEAR FLOW IN A 90° ELBOW. James J. Kramer and John D. Stanitz. July 1952. 44p. diagrs. (NACA TN 2736)

SUPERSONIC FLOW WITH WHIRL AND VORTICITY IN AXISYMMETRIC CHANNELS. Ralph J. Eschborn. August 1952. 41p. diagrs. (NACA TN 2768)

SEVERAL COMBINATION PROBES FOR SURVEYING STATIC AND TOTAL PRESSURE AND FLOW DIRECTION. Wallace M. Schulze, George C. Ashby, Jr. and John R. Erwin. November 1952. 64p. diagrs., photos., tab. (NACA TN 2830)

AUXILIARY EQUIPMENT AND TECHNIQUES FOR ADAPTING THE CONSTANT-TEMPERATURE HOT-WIRE ANEMOMETER TO SPECIFIC PROBLEMS IN AIR-FLOW MEASUREMENTS. James C. Laurence and L. Gene Landes. December 1952. ii, 77p. diagrs., photos., 3 tabs. (NACA TN 2843)

### AXIAL FLOW (3.7.1.1)

CONSTRUCTION AND USE OF CHARTS IN DESIGN STUDIES OF GAS TURBINES. Sumner Alpert and Rose M. Litrenta. July 1951. 57p. diagrs. (NACA TN 2402)

APPROXIMATE DESIGN METHOD FOR HIGH-SOLIDITY BLADE ELEMENTS IN COMPRESSORS AND TURBINES. John D. Stanitz. July 1951. 76p. diagrs., 2 tabs. (NACA TN 2408)

EXPRESSIONS FOR MEASURING THE ACCURACY OF APPROXIMATE SOLUTIONS TO COMPRESSIBLE FLOW THROUGH CASCADES OF BLADES WITH EXAMPLES OF USE. John T. Sinnette, Jr., George R. Costello and Robert L. Cummings. October 1951. 33p. diagrs. (NACA TN 2501)

EXPERIMENTAL INVESTIGATION OF AN 0.8 HUB-TIP RADIUS-RATIO, NONTWISTED-ROTOR-BLADE TURBINE. David H. Silvern and William R. Slivka. December 1951. 18p. diagrs. (NACA RM E51G14)

ANALYTICAL INVESTIGATION ON SOME THREE-DIMENSIONAL FLOW PROBLEMS IN TURBOMACHINES. Frank E. Marble and Irving Michelson, California Institute of Technology. March 1952. 109p. diagrs., 2 tabs. (NACA TN 2614)

APPLICATION OF A CHANNEL DESIGN METHOD TO HIGH-SOLIDITY CASCADES AND TESTS OF AN IMPULSE CASCADE WITH 90° OF TURNING. John D. Stanitz and Leonard J. Sheldrake. March 1952. 65p. diagrs., photos., 2 tabs. (NACA TN 2652)

APPLICATION OF SUPERSONIC VORTEX-FLOW THEORY TO THE DESIGN OF SUPERSONIC IMPULSE COMPRESSOR- OR TURBINE-BLADE SECTIONS. Emanuel Boxer, James R. Sterrett and John Wlodarski. April 24, 1952. 70p. diagrs., photos., 4 tabs. (NACA RM L52B06) (Declassified from Confidential, 4/13/53)

*Axial Flow Theory and Experiment*  
(Cont.)

THEORETICAL INVESTIGATION OF VELOCITY DIAGRAMS OF A SINGLE-STAGE TURBINE FOR A TURBOJET ENGINE AT MAXIMUM THRUST PER SQUARE FOOT TURBINE FRONTAL AREA. (Revised). Leo Cohen. June 1952. 34p. diagrs., tab. (NACA TN 2732)

MATRIX AND RELAXATION SOLUTIONS THAT DETERMINE SUBSONIC THROUGH FLOW IN AN AXIAL-FLOW GAS TURBINE. Chung-Hua Wu. July 1952. 65p. diagrs., 7 tabs. (NACA TN 2750)

ONE-DIMENSIONAL ANALYSIS OF CHOKED-FLOW TURBINES. Robert E. English and Richard H. Cavicchi. October 1952. 53p. diagrs. (NACA TN 2810)

FLOW SURFACES IN ROTATING AXIAL-FLOW PASSAGES. John D. Stanitz and Gaylord O. Ellis. November 1952. 31p. diagrs. (NACA TN 2834)

EXPERIMENTAL INVESTIGATION OF LOSS IN AN ANNULAR CASCADE OF TURBINE-NOZZLE BLADES OF FREE VORTEX DESIGN. Hubert W. Allen, Milton G. Kofskey and Richard E. Chamness. January 1953. 33p. diagrs., photos., tab. (NACA TN 2871)

A RAPID METHOD FOR USE IN DESIGN OF TURBINES WITHIN SPECIFIED AERODYNAMIC LIMITS. Richard H. Cavicchi and Robert E. English. April 1953. 72p. diagrs., 2 tabs. (NACA TN 2905)

STUDY OF SECONDARY-FLOW PATTERNS IN AN ANNULAR CASCADE OF TURBINE NOZZLE BLADES WITH VORTEX DESIGN. Harold E. Rohliik, Hubert W. Allen and Howard Z. Herzig. March 1953. 29p. diagrs., photos. (NACA TN 2909)

RADIAL FLOW  
(3.7.1.2)

APPROXIMATE DESIGN METHOD FOR HIGH-SOLIDITY BLADE ELEMENTS IN COMPRESSORS AND TURBINES. John D. Stanitz. July 1951. 76p. diagrs., 2 tabs. (NACA TN 2408)

MIXED FLOW  
(3.7.1.3)

EXPERIMENTAL INVESTIGATION OF THE MIXING LOSS BEHIND THE TRAILING EDGE OF A CASCADE OF THREE 90° SUPERSONIC TURNING PASSAGES. Luke L. Liccini. August 15, 1950. 31p. diagrs., photos., tab. (NACA RM L50F21a) (Declassified from Confidential, 4/13/53)

APPROXIMATE DESIGN METHOD FOR HIGH-SOLIDITY BLADE ELEMENTS IN COMPRESSORS AND TURBINES. John D. Stanitz. July 1951. 76p. diagrs., 2 tabs. (NACA TN 2408)

A METHOD OF SOLVING THE DIRECT AND INVERSE PROBLEM OF SUPERSONIC FLOW ALONG ARBITRARY STREAM FILAMENTS OF REVOLUTION IN TURBOMACHINES. Chung-Hua Wu and Eleanor L. Costilow. September 1951. 25p. diagrs. (NACA TN 2492)

TWO-DIMENSIONAL FLOW ON GENERAL SURFACES OF REVOLUTION IN TURBOMACHINES. John D. Stanitz and Gaylord O. Ellis. March 1952. 44p. diagrs., tab. (NACA TN 2654)

COOLING  
(3.7.2)

COOLING OF GAS TURBINES. I - EFFECTS OF ADDITION OF FINS TO BLADE TIPS AND ROTOR, ADMISSION OF COOLING AIR THROUGH PART OF NOZZLES, AND CHANGE IN THERMAL CONDUCTIVITY OF TURBINE COMPONENTS. W. Byron Brown. February 11, 1947. 26p. diagrs. (NACA RM E7B11a) (Declassified from Restricted, 6/5/53)

COOLING OF GAS TURBINES. II - EFFECTIVENESS OF RIM COOLING OF BLADES. Lincoln Wolfenstein, Gene L. Meyer and John S. McCarthy. March 18, 1947. 31p. diagrs. (NACA RM E7B11b) (Declassified from Restricted, 6/5/53)

COOLING OF GAS TURBINES. VIII - THEORETICAL TEMPERATURE DISTRIBUTIONS THROUGH GAS TURBINE WITH SPECIAL BLADES AND COOLING FINS ON THE RIM. W. Byron Brown and John N. B. Livingood. February 17, 1948. 21p. diagrs. (NACA RM E7I22a) (Declassified from Restricted, 6/11/53)

COOLING OF GAS TURBINES. IX - COOLING EFFECTS FROM USE OF CERAMIC COATINGS ON WATER-COOLED TURBINE BLADES. W. Byron Brown and John N. B. Livingood. October 13, 1948. 26p. diagrs. (NACA RM E8H03) (Declassified from Restricted, 6/11/53)

THE STRUCTURE OF AIRY'S STRESS FUNCTION IN MULTIPLY CONNECTED REGIONS. (Struttura della funzione di Airy nei sistemi molteplicemente connessi). Giuseppe Grioli. July 1951. 34p. (NACA TM 1290. Trans. from Giornale di Matematiche, v.77, 1947, p.119-144).

INFLUENCE OF REFRACTION ON THE APPLICABILITY OF THE ZEHNDER-MACH INTERFEROMETER TO STUDIES OF COOLED BOUNDARY LAYERS. Martin R. Kinsler. September 1951. 39p. diagrs., tab. (NACA TN 2462)

TABLES OF EXACT LAMINAR-BOUNDARY-LAYER SOLUTIONS WHEN THE WALL IS POROUS AND FLUID PROPERTIES ARE VARIABLE. W. Byron Brown and Patrick L. Donoughe. September 1951. 68p. diagrs., 2 tabs. (NACA TN 2479)

EXPERIMENTAL INVESTIGATION OF AN 0.8 HUB-TIP RADIUS-RATIO, NONTWISTED-ROTOR-BLADE TURBINE. David H. Silvern and William R. Slivka. December 1951. 18p. diagrs. (NACA RM E51G14)

A BIHARMONIC RELAXATION METHOD FOR CALCULATING THERMAL STRESS IN COOLED IRREGULAR CYLINDERS. Arthur G. Holms. 1952. ii, 19p. diagrs., 4 tabs. (NACA Rept. 1059. Formerly TN 2434)

ANALYSIS OF TEMPERATURE DISTRIBUTION IN LIQUID-COOLED TURBINE BLADES. John N. B. Livingood and W. Byron Brown. 1952. ii, 21p. diagrs. (NACA Rept. 1066. Formerly TN 2321)

*Cooling (Cont.)*

METHOD FOR CALCULATION OF HEAT TRANSFER IN LAMINAR REGION OF AIR FLOW AROUND CYLINDERS OF ARBITRARY CROSS SECTION (INCLUDING LARGE TEMPERATURE DIFFERENCES AND TRANSPIRATION COOLING). E. R. G. Eckert and John N. B. Livingood. June 1952. 71p. diags. (NACA TN 2733)

USE OF A CONSOLIDATED POROUS MEDIUM FOR MEASUREMENT OF FLOW RATE AND VISCOSITY OF GASES AT ELEVATED PRESSURES AND TEMPERATURES. Martin B. Biles and J. A. Putnam, University of California. September 1952. 51p. diags., photos., 7 tabs. (NACA TN 2783)

SOLUTIONS OF LAMINAR-BOUNDARY-LAYER EQUATIONS WHICH RESULT IN SPECIFIC-WEIGHT-FLOW PROFILES LOCALLY EXCEEDING FREE-STREAM VALUES. W. Byron Brown and John N. B. Livingood. September 1952. 36p. diags., 2 tabs. (NACA TN 2800)

RADIANT-INTERCHANGE CONFIGURATION FACTORS. D. C. Hamilton and W. R. Morgan, Purdue University. December 1952. 110p. diags., photos., 14 tabs. (NACA TN 2836)

LAMINAR NATURAL-CONVECTION FLOW AND HEAT TRANSFER OF FLUIDS WITH AND WITHOUT HEAT SOURCES IN CHANNELS WITH CONSTANT WALL TEMPERATURES. Simon Ostrach. December 1952. 55p. diags. (NACA TN 2863)

PRESSURE DISTRIBUTIONS ABOUT FINITE WEDGES IN BOUNDED AND UNBOUNDED SUBSONIC STREAMS. Patrick L. Donoughe and Ernst I. Prasse. May 1953. 41p. diags., photos., 2 tabs. (NACA TN 2942)

## STRESS AND VIBRATION (3.7.3)

ANALYTICAL INVESTIGATION OF DISTRIBUTION OF CENTRIFUGAL STRESSES AND THEIR RELATION TO LIMITING OPERATING TEMPERATURES IN GAS-TURBINE BLADES. Richard H. Kemp and William C. Morgan. April 12, 1948. 25p. photo., diags. (NACA RM E7L05) (Declassified from Restricted, 6/11/53)

ANALYTICAL DETERMINATION OF COUPLED BENDING-TORSION VIBRATIONS OF CANTILEVER BEAMS BY MEANS OF STATION FUNCTIONS. Alexander Mendelson and Selwyn Gendler. 1951. ii, 20p. diags., 10 tabs. (NACA Rept. 1005. Formerly TN 2185)

ANALYSIS OF PLANE-PLASTIC-STRESS PROBLEMS WITH AXIAL SYMMETRY IN STRAIN-HARDENING RANGE. M. H. Lee Wu. 1951. ii, 23p. diags. (NACA Rept. 1021. Formerly NACA TN 2217)

INFLUENCE OF TENSILE STRENGTH AND DUCTILITY ON STRENGTHS OF ROTATING DISKS IN PRESENCE OF MATERIAL AND FABRICATION DEFECTS OF SEVERAL TYPES. Arthur G. Holms, Joseph E. Jenkins and Andrew J. Repko. June 1951. 39p. diags., photos., tab. (NACA TN 2397)

THE STRUCTURE OF AIRY'S STRESS FUNCTION IN MULTIPLY CONNECTED REGIONS. (Struttura della funzione di Airy nei sistemi moltiplicemente connessi). Giuseppe Grioli. July 1951. 34p. (NACA TM 1290. Trans. from Giornale di Matematiche, v.77, 1947, p.119-144).

A BIHARMONIC RELAXATION METHOD FOR CALCULATING THERMAL STRESS IN COOLED IRREGULAR CYLINDERS. Arthur G. Holms. 1952. ii, 19p. diags., 4 tabs. (NACA Rept. 1059. Formerly TN 2434)

CORRELATION OF TENSILE STRENGTH, TENSILE DUCTILITY, AND NOTCH TENSILE STRENGTH WITH THE STRENGTH OF ROTATING DISKS OF SEVERAL DESIGNS IN THE RANGE OF LOW AND INTERMEDIATE DUCTILITY. Arthur G. Holms and Andrew J. Repko. September 1952. 30p. diags., 3 tabs. (NACA TN 2791)

A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE INFLUENCE OF TEMPERATURE GRADIENTS ON THE DEFORMATION AND BURST SPEEDS OF ROTATING DISKS. P. I. Wilterdink, A. G. Holms and S. S. Manson. October 1952. 45p. diags., photo., 2 tabs. (NACA TN 2803)

## MATCHING (3.7.4)

METHOD OF MATCHING COMPONENTS AND PREDICTING PERFORMANCE OF A TURBINE-PROPELLER ENGINE. Alois T. Sutor and Morris A. Zipkin. September 1951. 75p. diags. (NACA TN 2450)

A THERMODYNAMIC STUDY OF THE TURBINE-PROPELLER ENGINE. Benjamin Pinkel and Irving M. Karp. March 1952. 90p. diags. (NACA TN 2653)

## Friction and Lubrication

### (3.8)

EFFECTS OF SOLVENTS IN IMPROVING BOUNDARY LUBRICATION OF STEEL BY SILICONES. S. F. Murray and Robert L. Johnson. September 1952. 23p. diags., 2 tabs. (NACA TN 2788)

### THEORY AND EXPERIMENT

#### (3.8.1)

INVESTIGATION OF FRETTING BY MICROSCOPIC OBSERVATION. Douglas Godfrey. 1951. ii, 10p. photos. (NACA Rept. 1009. Formerly TN 2039)

HYDRODYNAMIC LUBRICATION OF CYCLICALLY LOADED BEARINGS. R. W. Dayton and E. M. Simons, Battelle Memorial Institute. November 1951. 76p. diags., photos. (NACA TN 2544)

DISCREPANCIES BETWEEN THEORETICAL AND OBSERVED BEHAVIOR OF CYCLICALLY LOADED BEARINGS. R. W. Dayton, E. M. Simons and F. A. Fend, Battelle Memorial Institute. November 1951. 27p. diags., photos. (NACA TN 2545)

LUBRICATION AND COOLING STUDIES OF CYLINDRICAL-ROLLER BEARINGS AT HIGH SPEEDS. E. Fred Macks and Zolton N. Nemeth. 1952. ii, 15p. diags., 2 tabs. (NACA Rept. 1064. Formerly TN 2420)

COMPARISON OF HIGH-SPEED OPERATING CHARACTERISTICS OF SIZE 215 CYLINDRICAL-ROLLER BEARINGS AS DETERMINED IN TURBOJET ENGINE AND IN LABORATORY TEST RIG. E. Fred Macks and Zolton N. Nemeth. 1952. ii, 12p. diags., photos., tab. (NACA Rept. 1084. Formerly RM E51105)

BONDING OF MOLYBDENUM DISULFIDE TO VARIOUS MATERIALS TO FORM A SOLID LUBRICATING FILM. I - THE BONDING MECHANISM. Douglas Godfrey and Edmond E. Bisson. February 1952. 16p. photos., 4 tabs. (NACA TN 2628)

INFLUENCE OF LUBRICANT VISCOSITY ON OPERATING TEMPERATURES OF 75-MILLIMETER-BORE CYLINDRICAL-ROLLER BEARING AT HIGH SPEEDS. E. Fred Macks, William J. Anderson and Zolton N. Nemeth. February 1952. 47p. diags., photo., 3 tabs. (NACA TN 2636)

FRICTION AND SURFACE DAMAGE OF SEVERAL CORROSION-RESISTANT MATERIALS. Marshall B. Peterson and Robert L. Johnson. February 1952. 20p. photos., diags., 2 tabs. (NACA RM E51L20)

EFFECTS OF SOLVENTS IN IMPROVING BOUNDARY LUBRICATION OF STEEL BY SILICONES. S. F. Murray and Robert L. Johnson. September 1952. 23p. diags., 2 tabs. (NACA TN 2788)

BONDING OF MOLYBDENUM DISULFIDE TO VARIOUS MATERIALS TO FORM A SOLID LUBRICATING FILM. II - FRICTION AND ENDURANCE CHARACTERISTICS OF FILMS BONDED BY PRACTICAL METHODS. Douglas Godfrey and Edmond E. Bisson. October 1952. 16p. diags. (NACA TN 2802)

EXPERIMENTAL INVESTIGATION OF ECCENTRICITY RATIO, FRICTION, AND OIL FLOW OF SHORT JOURNAL BEARINGS. G. B. DuBois and F. W. Ocvirk, Cornell University. November 1952. 79p. diags., photos., 4 tabs. (NACA TN 2809)

INVESTIGATION OF 75-MILLIMETER-BORE DEEP-GROOVE BALL BEARINGS UNDER RADIAL LOAD AT HIGH SPEEDS. I - OIL-FLOW STUDIES. Zolton N. Nemeth, E. Fred Macks and William J. Anderson. December 1952. 30p. diags., 2 tabs. (NACA TN 2841)

EFFECTIVE LUBRICATION RANGE FOR STEEL SURFACES BOUNDARY LUBRICATED AT HIGH SLIDING VELOCITIES BY VARIOUS CLASSES OF SYNTHETIC FLUIDS. Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. December 1952. 23p. diags., photos., tab. (NACA TN 2846)

PRELIMINARY COMPARISON OF 17- AND 75-MILLIMETER-BORE CAGELESS CYLINDRICAL ROLLER BEARINGS WITH CONVENTIONAL CYLINDRICAL ROLLER BEARINGS AT HIGH SPEEDS. E. Fred Macks, W. J. Anderson and Zolton N. Nemeth. March 1953. 39p. diags., photos., tab. (NACA RM E52L05)

### HYDRODYNAMIC THEORY

#### (3.8.1.1)

EXPERIMENTAL INVESTIGATION OF OIL FILM PRESSURE DISTRIBUTION FOR MISALINED PLAIN BEARINGS. G. B. DuBois, H. H. Mabie and F. W. Ocvirk, Cornell University. October 1951. 89p. diags., photos., tab. (NACA TN 2507)

LUBRICATION AND COOLING STUDIES OF CYLINDRICAL-ROLLER BEARINGS AT HIGH SPEEDS. E. Fred Macks and Zolton N. Nemeth. 1952. ii, 15p. diags., 2 tabs. (NACA Rept. 1064. Formerly TN 2420)

FRICTION AND WEAR. (Le frottement et l'usure). J. Pomey. March 1952. 108p. diags., photos., 12 tabs. (NACA TM 1318. Trans. from Office National d'Etudes et de Recherches Aéronautiques, Rapport Technique 36, 1948; Groupement Français pour le Développement des Recherches Aéronautiques).

SHORT-BEARING APPROXIMATION FOR FULL JOURNAL BEARINGS. F. W. Ocvirk. Cornell University. October 1952. 61p. diags. (NACA TN 2808)

## PROPULSION

### 126 FRICTION AND LUBRICATION (3.8)

#### *Hydrodynamic Theory (Cont.)*

EFFECT OF HIGH BULK TEMPERATURES ON BOUNDARY LUBRICATION OF STEEL SURFACES BY SYNTHETIC FLUIDS. S. F. Murray, Robert L. Johnson and Edmond E. Bisson. May 1953. 27p. diags., photos., 2 tabs. (NACA TN 2940)

#### CHEMISTRY OF LUBRICATION (3.8.1.2)

FORMATION OF SULFIDE FILMS ON STEEL AND EFFECT OF SUCH FILMS ON STATIC FRICTION. Erva C. Levine and Marshall B. Peterson. September 1951. 26p. diags., photos. (NACA TN 2460)

BONDING OF MOLYBDENUM DISULFIDE TO VARIOUS MATERIALS TO FORM A SOLID LUBRICATING FILM. I - THE BONDING MECHANISM. Douglas Godfrey and Edmond E. Bisson. February 1952. 16p. photos., 4 tabs. (NACA TN 2628)

FRICTION AND WEAR. (Le frottement et l'usure). J. Pomey. March 1952. 108p. diags., photos., 12 tabs. (NACA TM 1318. Trans. from Office National d'Etudes et de Recherches Aéronautiques, Rapport Technique 36, 1948; Groupement Français pour le Développement des Recherches Aéronautiques).

EFFECTS OF SOLVENTS IN IMPROVING BOUNDARY LUBRICATION OF STEEL BY SILICONES. S. F. Murray and Robert L. Johnson. September 1952. 23p. diags., 2 tabs. (NACA TN 2788)

BONDING OF MOLYBDENUM DISULFIDE TO VARIOUS MATERIALS TO FORM A SOLID LUBRICATING FILM. II - FRICTION AND ENDURANCE CHARACTERISTICS OF FILMS BONDED BY PRACTICAL METHODS. Douglas Godfrey and Edmond E. Bisson. October 1952. 16p. diags. (NACA TN 2802)

EFFECTIVE LUBRICATION RANGE FOR STEEL SURFACES BOUNDARY LUBRICATED AT HIGH SLIDING VELOCITIES BY VARIOUS CLASSES OF SYNTHETIC FLUIDS. Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. December 1952. 23p. diags., photos., tab. (NACA TN 2846)

EFFECT OF HIGH BULK TEMPERATURES ON BOUNDARY LUBRICATION OF STEEL SURFACES BY SYNTHETIC FLUIDS. S. F. Murray, Robert L. Johnson and Edmond E. Bisson. May 1953. 27p. diags., photos., 2 tabs. (NACA TN 2940)

#### SURFACE CONDITIONS (3.8.1.3)

FORMATION OF SULFIDE FILMS ON STEEL AND EFFECT OF SUCH FILMS ON STATIC FRICTION. Erva C. Levine and Marshall B. Peterson. September 1951. 26p. diags., photos. (NACA TN 2460)

INVESTIGATION OF WEAR AND FRICTION PROPERTIES UNDER SLIDING CONDITIONS OF SOME MATERIALS SUITABLE FOR CAGES OF ROLLING-CONTACT BEARINGS. Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. 1952. ii, 12p. diags., photos., tab. (NACA Rept. 1062. Formerly TN 2384)

BONDING OF MOLYBDENUM DISULFIDE TO VARIOUS MATERIALS TO FORM A SOLID LUBRICATING FILM. I - THE BONDING MECHANISM. Douglas Godfrey and Edmond E. Bisson. February 1952. 16p. photos., 4 tabs. (NACA TN 2628)

FRICTION AND WEAR. (Le frottement et l'usure). J. Pomey. March 1952. 108p. diags., photos., 12 tabs. (NACA TM 1318. Trans. from Office National d'Etudes et de Recherches Aéronautiques, Rapport Technique 36, 1948; Groupement Français pour le Développement des Recherches Aéronautiques).

WEAR AND SLIDING FRICTION PROPERTIES OF NICKEL ALLOYS SUITED FOR CAGES OF HIGH-TEMPERATURE ROLLING-CONTACT BEARINGS. I - ALLOYS RETAINING MECHANICAL PROPERTIES TO 600° F. Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. August 1952. 30p. diags., photos., 3 tabs. (NACA TN 2758)

WEAR AND SLIDING FRICTION PROPERTIES OF NICKEL ALLOYS SUITED FOR CAGES OF HIGH-TEMPERATURE ROLLING-CONTACT BEARINGS. II - ALLOYS RETAINING MECHANICAL PROPERTIES ABOVE 600° F. Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. August 1952. 29p. diags., photos., 3 tabs. (NACA TN 2759)

BONDING OF MOLYBDENUM DISULFIDE TO VARIOUS MATERIALS TO FORM A SOLID LUBRICATING FILM. II - FRICTION AND ENDURANCE CHARACTERISTICS OF FILMS BONDED BY PRACTICAL METHODS. Douglas Godfrey and Edmond E. Bisson. October 1952. 16p. diags. (NACA TN 2802)

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EFFECT OF HIGH BULK TEMPERATURES ON BOUNDARY LUBRICATION OF STEEL SURFACES BY SYNTHETIC FLUIDS. S. F. Murray, Robert L. Johnson and Edmond E. Bisson. May 1953. 27p. diags., photos., 2 tabs. (NACA TN 2940)

#### SLIDING CONTACT SURFACES (3.8.2)

INVESTIGATION OF FRETTING BY MICROSCOPIC OBSERVATION. Douglas Godfrey. 1951. ii, 10p. photos. (NACA Rept. 1009. Formerly TN 2039)

FORMATION OF SULFIDE FILMS ON STEEL AND EFFECT OF SUCH FILMS ON STATIC FRICTION. Erva C. Levine and Marshall B. Peterson. September 1951. 26p. diags., photos. (NACA TN 2460)

INVESTIGATION OF WEAR AND FRICTION PROPERTIES UNDER SLIDING CONDITIONS OF SOME MATERIALS SUITABLE FOR CAGES OF ROLLING-CONTACT BEARINGS. Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. 1952. ii, 12p. diags., photos., tab. (NACA Rept. 1062. Formerly TN 2384)

*Sliding Contact Surfaces (Cont.)*

FRICTION AND SURFACE DAMAGE OF SEVERAL CORROSION-RESISTANT MATERIALS. Marshall B. Peterson and Robert L. Johnson. February 1952. 20p. photos., diagrs., 2 tabs. (NACA RM E51L20)

FRICTION AND WEAR. (Le frottement et l'usure). J. Pomey. March 1952. 108p. diagrs., photos., 12 tabs. (NACA TM 1318. Trans. from Office National d'Études et de Recherches Aéronautiques, Rapport Technique 36, 1948; Groupement Français pour le Développement des Recherches Aéronautiques).

WEAR AND SLIDING FRICTION PROPERTIES OF NICKEL ALLOYS SUITED FOR CAGES OF HIGH-TEMPERATURE ROLLING-CONTACT BEARINGS. I - ALLOYS RETAINING MECHANICAL PROPERTIES TO 600° F. Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. August 1952. 30p. diagrs., photos., 3 tabs. (NACA TN 2758)

WEAR AND SLIDING FRICTION PROPERTIES OF NICKEL ALLOYS SUITED FOR CAGES OF HIGH-TEMPERATURE ROLLING-CONTACT BEARINGS. II - ALLOYS RETAINING MECHANICAL PROPERTIES ABOVE 600° F. Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. August 1952. 29p. diagrs., photos., 3 tabs. (NACA TN 2759)

EFFECTIVE LUBRICATION RANGE FOR STEEL SURFACES BOUNDARY LUBRICATED AT HIGH SLIDING VELOCITIES BY VARIOUS CLASSES OF SYNTHETIC FLUIDS. Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. December 1952. 23p. diagrs., photos., tab. (NACA TN 2846)

EFFECT OF HIGH BULK TEMPERATURES ON BOUNDARY LUBRICATION OF STEEL SURFACES BY SYNTHETIC FLUIDS. S. F. Murray, Robert L. Johnson and Edmond E. Bisson. May 1953. 27p. diagrs., photos., 2 tabs. (NACA TN 2940)

**SLEEVE BEARINGS  
(3.8.2.1)**

EXPERIMENTAL INVESTIGATION OF OIL FILM PRESSURE DISTRIBUTION FOR MISALIGNED PLAIN BEARINGS. G. B. DuBois, H. H. Mabie and F. W. Ocvirk, Cornell University. October 1951. 89p. diagrs., photos., tab. (NACA TN 2507)

HYDRODYNAMIC LUBRICATION OF CYCLICALLY LOADED BEARINGS. R. W. Dayton and E. M. Simons, Battelle Memorial Institute. November 1951. 76p. diagrs., photos. (NACA TN 2544)

DISCREPANCIES BETWEEN THEORETICAL AND OBSERVED BEHAVIOR OF CYCLICALLY LOADED BEARINGS. R. W. Dayton, E. M. Simons and F. A. Fend, Battelle Memorial Institute. November 1951. 27p. diagrs., photos. (NACA TN 2545)

FRICTION AND WEAR. (Le frottement et l'usure). J. Pomey. March 1952. 108p. diagrs., photos., 12 tabs. (NACA TM 1318. Trans. from Office National d'Études et de Recherches Aéronautiques, Rapport Technique 36, 1948; Groupement Français pour le Développement des Recherches Aéronautiques).

SHORT-BEARING APPROXIMATION FOR FULL JOURNAL BEARINGS. F. W. Ocvirk, Cornell University. October 1952. 61p. diagrs. (NACA TN 2808)

EXPERIMENTAL INVESTIGATION OF ECCENTRICITY RATIO, FRICTION, AND OIL FLOW OF SHORT JOURNAL BEARINGS. G. B. DuBois and F. W. Ocvirk, Cornell University. November 1952. 79p. diagrs., photos., 4 tabs. (NACA TN 2809)

**CYLINDER AND PISTON  
MECHANISMS  
(3.8.2.2)**

DYNAMICS OF MECHANICAL FEEDBACK-TYPE HYDRAULIC SERVOMOTORS UNDER INERTIA LOADS. Harold Gold, Edward W. Otto and Victor L. Ransom. August 1952. 63p. diagrs., photos. (NACA TN 2767)

**ROLLING CONTACT SURFACES  
(3.8.3)**

LUBRICATION AND COOLING STUDIES OF CYLINDRICAL-ROLLER BEARINGS AT HIGH SPEEDS. E. Fred Macks and Zolton N. Nemeth. 1952. ii, 15p. diagrs., 2 tabs. (NACA Rept. 1064. Formerly TN 2420)

INFLUENCE OF LUBRICANT VISCOSITY ON OPERATING TEMPERATURES OF 75-MILLIMETER-BORE CYLINDRICAL-ROLLER BEARING AT HIGH SPEEDS. E. Fred Macks, William J. Anderson and Zolton N. Nemeth. February 1952. 47p. diagrs., photo., 3 tabs. (NACA TN 2636)

FRICTION AND WEAR. (Le frottement et l'usure). J. Pomey. March 1952. 108p. diagrs., photos., 12 tabs. (NACA TM 1318. Trans. from Office National d'Études et de Recherches Aéronautiques, Rapport Technique 36, 1948; Groupement Français pour le Développement des Recherches Aéronautiques).

INVESTIGATION OF 75-MILLIMETER-BORE DEEP-GROOVE BALL BEARINGS UNDER RADIAL LOAD AT HIGH SPEEDS. I - OIL-FLOW STUDIES. Zolton N. Nemeth, E. Fred Macks and William J. Anderson. December 1952. 30p. diagrs., 2 tabs. (NACA TN 2841)

PRELIMINARY COMPARISON OF 17- AND 75-MILLIMETER-BORE CAGELESS CYLINDRICAL ROLLER BEARINGS WITH CONVENTIONAL CYLINDRICAL ROLLER BEARINGS AT HIGH SPEEDS. E. Fred Macks, W. J. Anderson and Zolton N. Nemeth. March 1953. 39p. diagrs., photos., tab. (NACA RM E52L05)

**ANTI-FRICTION BEARINGS  
(3.8.3.1)**

INVESTIGATION OF WEAR AND FRICTION PROPERTIES UNDER SLIDING CONDITIONS OF SOME MATERIALS SUITABLE FOR CAGES OF ROLLING-CONTACT BEARINGS. Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. 1952. ii, 12p. diagrs., photos., tab. (NACA Rept. 1062. Formerly TN 2384)



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### *Antifriction Bearings (Cont.)*

LUBRICATION AND COOLING STUDIES OF CYLINDRICAL-ROLLER BEARINGS AT HIGH SPEEDS. E. Fred Macks and Zolton N. Nemeth. 1952. ii, 15p. diags., 2 tabs. (NACA Rept. 1064. Formerly TN 2420)

COMPARISON OF HIGH-SPEED OPERATING CHARACTERISTICS OF SIZE 215 CYLINDRICAL-ROLLER BEARINGS AS DETERMINED IN TURBOJET ENGINE AND IN LABORATORY TEST RIG. E. Fred Macks and Zolton N. Nemeth. 1952. ii, 12p. diags., photos., tab. (NACA Rept. 1084. Formerly RM E51105)

INFLUENCE OF LUBRICANT VISCOSITY ON OPERATING TEMPERATURES OF 75-MILLIMETER-BORE CYLINDRICAL-ROLLER BEARING AT HIGH SPEEDS. E. Fred Macks, William J. Anderson and Zolton N. Nemeth. February 1952. 47p. diags., photo., 3 tabs. (NACA TN 2636)

WEAR AND SLIDING FRICTION PROPERTIES OF NICKEL ALLOYS SUITED FOR CAGES OF HIGH-TEMPERATURE ROLLING-CONTACT BEARINGS. I - ALLOYS RETAINING MECHANICAL PROPERTIES TO 600° F. Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. August 1952. 30p. diags., photos., 3 tabs. (NACA TN 2758)

WEAR AND SLIDING FRICTION PROPERTIES OF NICKEL ALLOYS SUITED FOR CAGES OF HIGH-TEMPERATURE ROLLING-CONTACT BEARINGS. II - ALLOYS RETAINING MECHANICAL PROPERTIES ABOVE 600° F. Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. August 1952. 29p. diags., photos., 3 tabs. (NACA TN 2759)

INVESTIGATION OF 75-MILLIMETER-BORE DEEP-GROOVE BALL BEARINGS UNDER RADIAL LOAD AT HIGH SPEEDS. I - OIL-FLOW STUDIES. Zolton N. Nemeth, E. Fred Macks and William J. Anderson. December 1952. 30p. diags., 2 tabs. (NACA TN 2841)

PRELIMINARY COMPARISON OF 17- AND 75-MILLIMETER-BORE CAGELESS CYLINDRICAL ROLLER BEARINGS WITH CONVENTIONAL CYLINDRICAL ROLLER BEARINGS AT HIGH SPEEDS. E. Fred Macks, W. J. Anderson and Zolton N. Nemeth. March 1953. 39p. diags., photos., tab. (NACA RM E52L05)

### SLIDING AND ROLLING CONTACT SURFACES (3.8.4)

LUBRICATION AND COOLING STUDIES OF CYLINDRICAL-ROLLER BEARINGS AT HIGH SPEEDS. E. Fred Macks and Zolton N. Nemeth. 1952. ii, 15p. diags., 2 tabs. (NACA Rept. 1064. Formerly TN 2420)

COMPARISON OF HIGH-SPEED OPERATING CHARACTERISTICS OF SIZE 215 CYLINDRICAL-ROLLER BEARINGS AS DETERMINED IN TURBOJET ENGINE AND IN LABORATORY TEST RIG. E. Fred Macks and Zolton N. Nemeth. 1952. ii, 12p. diags., photos., tab. (NACA Rept. 1084. Formerly RM E51105)

INFLUENCE OF LUBRICANT VISCOSITY ON OPERATING TEMPERATURES OF 75-MILLIMETER-BORE CYLINDRICAL-ROLLER BEARING AT HIGH SPEEDS. E. Fred Macks, William J. Anderson and Zolton N. Nemeth. February 1952. 47p. diags., photo., 3 tabs. (NACA TN 2636)

INVESTIGATION OF 75-MILLIMETER-BORE DEEP-GROOVE BALL BEARINGS UNDER RADIAL LOAD AT HIGH SPEEDS. I - OIL-FLOW STUDIES. Zolton N. Nemeth, E. Fred Macks and William J. Anderson. December 1952. 30p. diags., 2 tabs. (NACA TN 2841)

PRELIMINARY COMPARISON OF 17- AND 75-MILLIMETER-BORE CAGELESS CYLINDRICAL ROLLER BEARINGS WITH CONVENTIONAL CYLINDRICAL ROLLER BEARINGS AT HIGH SPEEDS. E. Fred Macks, W. J. Anderson and Zolton N. Nemeth. March 1953. 39p. diags., photos., tab. (NACA RM E52L05)

### LUBRICANTS (3.8.5)

BONDING OF MOLYBDENUM DISULFIDE TO VARIOUS MATERIALS TO FORM A SOLID LUBRICATING FILM. I - THE BONDING MECHANISM. Douglas Godfrey and Edmond E. Bisson. February 1952. 16p. photos., 4 tabs. (NACA TN 2628)

INFLUENCE OF LUBRICANT VISCOSITY ON OPERATING TEMPERATURES OF 75-MILLIMETER-BORE CYLINDRICAL-ROLLER BEARING AT HIGH SPEEDS. E. Fred Macks, William J. Anderson and Zolton N. Nemeth. February 1952. 47p. diags., photo., 3 tabs. (NACA TN 2636)

FRICTION AND WEAR. (Le frottement et l'usure). J. Pomey. March 1952. 108p. diags., photos., 12 tabs. (NACA TM 1318. Trans. from Office National d'Études et de Recherches Aéronautiques, Rapport Technique 36, 1948; Groupement Français pour le Développement des Recherches Aéronautiques).

EFFECTS OF SOLVENTS IN IMPROVING BOUNDARY LUBRICATION OF STEEL BY SILICONES. S. F. Murray and Robert L. Johnson. September 1952. 23p. diags., 2 tabs. (NACA TN 2788)

BONDING OF MOLYBDENUM DISULFIDE TO VARIOUS MATERIALS TO FORM A SOLID LUBRICATING FILM. II - FRICTION AND ENDURANCE CHARACTERISTICS OF FILMS BONDED BY PRACTICAL METHODS. Douglas Godfrey and Edmond E. Bisson. October 1952. 16p. diags. (NACA TN 2802)

EFFECTIVE LUBRICATION RANGE FOR STEEL SURFACES BOUNDARY LUBRICATED AT HIGH SLIDING VELOCITIES BY VARIOUS CLASSES OF SYNTHETIC FLUIDS. Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. December 1952. 23p. diags., photos., tab. (NACA TN 2846)

INVESTIGATION OF SPONTANEOUS IGNITION TEMPERATURES OF ORGANIC COMPOUNDS WITH PARTICULAR EMPHASIS ON LUBRICANTS. Charles E. Frank, Angus U. Blackham and Donald E. Swarts, University of Cincinnati. December 1952. 40p. diags., 6 tabs. (NACA TN 2848)

EFFECT OF HIGH BULK TEMPERATURES ON BOUNDARY LUBRICATION OF STEEL SURFACES BY SYNTHETIC FLUIDS. S. F. Murray, Robert L. Johnson and Edmond E. Bisson. May 1953. 27p. diags., photos., 2 tabs. (NACA TN 2940)

## Heat Transfer

### (3.9)

**INTERNAL-FILM COOLING OF ROCKET NOZZLES.** J. L. Sloop and George R. Kinney. June 8, 1948. 40p. diags., photos. (NACA RM E8A29a) (Declassified from Restricted, 1/3/52)

**TEMPERATURE DISTRIBUTION IN INTERNALLY HEATED WALLS OF HEAT EXCHANGERS COMPOSED OF NONCIRCULAR FLOW PASSAGES.** E. R. G. Eckert and George M. Low. 1951. ii, 14p. diags. (NACA Rept. 1022. Formerly TN 2257)

**TEMPERATURE DISTRIBUTION IN INTERNALLY HEATED WALLS OF HEAT EXCHANGERS WITH NONCIRCULAR FLOW PASSAGES USING COOLANTS WITH VERY LOW PRANDTL NUMBER.** E. R. G. Eckert and George M. Low. July 1951. 29p. diags. (NACA TN 2401)

**AN INVESTIGATION OF AIRCRAFT HEATERS. XXXV - THERMOCOUPLE CONDUCTION ERROR OBSERVED IN MEASURING SURFACE TEMPERATURES.** L. M. K. Boelter and R. W. Lockhart, University of California. July 1951. 34p. diags., photos., tab. (NACA TN 2427)

**AN INVESTIGATION OF AIRCRAFT HEATERS. XXXVIII - DETERMINATION OF THERMAL PERFORMANCE OF RECTANGULAR- AND TRAPEZOIDAL-SHAPED INNER-SKIN PASSAGES FOR ANTI-ICING SYSTEMS.** L. M. K. Boelter, V. D. Sanders and F. E. Romie, University of California. November 1951. 21p. diags., photos. (NACA TN 2524)

**COMPARISON OF HIGH-SPEED OPERATING CHARACTERISTICS OF SIZE 215 CYLINDRICAL-ROLLER BEARINGS AS DETERMINED IN TURBOJET ENGINE AND IN LABORATORY TEST RIG.** E. Fred Macks and Zolton N. Nemeth. 1952. ii, 12p. diags., photos., tab. (NACA Rept. 1084. Formerly RM E51105)

**INTERNAL-LIQUID-FILM-COOLING EXPERIMENTS WITH AIRSTREAM TEMPERATURES TO 2000° F IN 2- AND 4-INCH-DIAMETER HORIZONTAL TUBES.** George R. Kinney, Andrew E. Abramson and John L. Sloop. 1952. ii, 21p. diags., photos., 5 tabs. (NACA Rept. 1087. Formerly RM E50F19; RM E51C13; RM E52B20)

**DESIGN OF APPARATUS FOR DETERMINING HEAT TRANSFER AND FRICTIONAL PRESSURE DROP OF NITRIC ACID FLOWING THROUGH A HEATED TUBE.** Bruce A. Reese and Robert W. Graham, Purdue University. June 1952. 61p. diags., photos., tab. (NACA RM 52D03)

**USE OF A CONSOLIDATED POROUS MEDIUM FOR MEASUREMENT OF FLOW RATE AND VISCOSITY OF GASES AT ELEVATED PRESSURES AND TEMPERATURES.** Martin B. Biles and J. A. Putnam, University of California. September 1952. 51p. diags., photos., 7 tabs. (NACA TN 2783)

**SIMPLE GRAPHICAL SOLUTION OF HEAT TRANSFER AND EVAPORATION FROM SURFACE HEATED TO PREVENT ICING.** Vernon H. Gray. October 1952. 19p. diags. (NACA TN 2799)

**LAMINAR NATURAL-CONVECTION FLOW AND HEAT TRANSFER OF FLUIDS WITH AND WITHOUT HEAT SOURCES IN CHANNELS WITH CONSTANT WALL TEMPERATURES.** Simon Ostrach. December 1952. 55p. diags. (NACA TN 2863)

**FORCED-CONVECTION HEAT-TRANSFER CHARACTERISTICS OF MOLTEN SODIUM HYDROXIDE.** Milton D. Grele and Louis Gedeon. February 1953. 27p. diags., photo., 2 tabs. (NACA RM E52L09)

**A METHOD FOR RAPID DETERMINATION OF THE ICING LIMIT OF A BODY IN TERMS OF THE STREAM CONDITIONS.** Edmund E. Callaghan and John S. Serafini. March 1953. 33p. diags. (NACA TN 2914)

## THEORY AND EXPERIMENT

### (3.9.1)

**COOLING OF GAS TURBINES. VIII - THEORETICAL TEMPERATURE DISTRIBUTIONS THROUGH GAS TURBINE WITH SPECIAL BLADES AND COOLING FINS ON THE RIM.** W. Byron Brown and John N. B. Livingood. February 17, 1948. 21p. diags. (NACA RM E7I22a) (Declassified from Restricted, 6/11/53)

**ANALYSIS OF TURBULENT FREE-CONVECTION BOUNDARY LAYER ON FLAT PLATE.** E. R. G. Eckert and Thomas W. Jackson. 1951. 7p. diags. (NACA Rept. 1015. Formerly TN 2207)

**MEASUREMENTS OF AVERAGE HEAT-TRANSFER AND FRICTION COEFFICIENTS FOR SUBSONIC FLOW OF AIR IN SMOOTH TUBES AT HIGH SURFACE AND FLUID TEMPERATURES.** Leroy V. Humble, Warren H. Lowdermilk and Leland G. Desmon. 1951. 15p. diags. (NACA Rept. 1020. Formerly RM E7L31; RM E8L03; RM E50E23; RM E50H23)

**VAPORIZATION RATES AND HEAT-TRANSFER COEFFICIENTS FOR PURE LIQUID DROPS.** Robert D. Ingebo. July 1951. 32p. diags., 2 tabs. (NACA TN 2368)

**ANALYTICAL INVESTIGATION OF FULLY DEVELOPED LAMINAR FLOW IN TUBES WITH HEAT TRANSFER WITH FLUID PROPERTIES VARIABLE ALONG THE RADIUS.** Robert G. Deissler. July 1951. 28p. diags. (NACA TN 2410)

PROPULSION  
130 HEAT TRANSFER (3.9)

*Theory and Experiment (Cont.)*

AN INVESTIGATION OF AIRCRAFT HEATERS. XXXIV - EXPERIMENTAL DETERMINATION OF THERMAL AND HYDRODYNAMICAL BEHAVIOR OF AIR FLOWING BETWEEN A FLAT AND A WAVE-SHAPED PLATE. L. M. K. Boelter, V. D. Sanders, G. Young, M. Morgan and E. H. Morrin, University of California. August 1951. 30p. diagrs. (NACA TN 2426)

HEAT DELIVERY IN A COMPRESSIBLE FLOW AND APPLICATIONS TO HOT-WIRE ANEMOMETRY. Chan-Mou Tchen, National Bureau of Standards. August 1951. 63p. diagrs. (NACA TN 2436)

ON THE RECORDING OF TURBULENT LONGITUDINAL AND TRANSVERSE FLUCTUATIONS. (Über das Messen turbulenter Längs- und Querschwankungen). H. Reichardt. August 1951. 10p. diagrs. (NACA TM 1313. Trans. from Zeitschrift für angewandte Mathematik und Mechanik, v. 18, no. 6, December 1938, p.358-361).

TABLES OF EXACT LAMINAR-BOUNDARY-LAYER SOLUTIONS WHEN THE WALL IS POROUS AND FLUID PROPERTIES ARE VARIABLE. W. Byron Brown and Patrick L. Donoughe. September 1951. 68p. diagrs., 2 tabs. (NACA TN 2479)

EXPERIMENTAL INVESTIGATION OF FORCED-CONVECTION HEAT-TRANSFER CHARACTERISTICS OF LEAD-BISMUTH EUTECTIC. Bernard Lubarsky. September 1951. 30p. diagrs., photo., tab. (NACA RM E51G02)

AN INVESTIGATION OF AIRCRAFT HEATERS. XXXVII - EXPERIMENTAL DETERMINATION OF THERMAL AND HYDRODYNAMICAL BEHAVIOR OF AIR FLOWING ALONG A FLAT PLATE CONTAINING TURBULENCE PROMOTERS. L. M. K. Boelter, G. Young, M. L. Greenfield, V. D. Sanders and M. Morgan, University of California. October 1951. 26p. diagrs. (NACA TN 2517)

FORCED-CONVECTION HEAT TRANSFER TO WATER AT HIGH PRESSURES AND TEMPERATURES IN THE NONBOILING REGION. S. J. Kaufman and R. W. Henderson. November 1951. 16p. diagrs., photos. (NACA RM E51I18)

COMPARISON OF HIGH-SPEED OPERATING CHARACTERISTICS OF SIZE 215 CYLINDRICAL-ROLLER BEARINGS AS DETERMINED IN TURBOJET ENGINE AND IN LABORATORY TEST RIG. E. Fred Macks and Zolton N. Nemeth. 1952. ii, 12p. diagrs., photos., tab. (NACA Rept. 1084. Formerly RM E51I05)

EXPERIMENTAL DETERMINATION OF TIME CONSTANTS AND NUSSELT NUMBERS FOR BARE-WIRE THERMOCOUPLES IN HIGH-VELOCITY AIR STREAMS AND ANALYTIC APPROXIMATION OF CONDUCTION AND RADIATION ERRORS. Marvin D. Scadron and Isidore Warshawsky. January 1952. 81p. diagrs., 4 tabs. (NACA TN 2599)

ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF FULLY DEVELOPED TURBULENT FLOW OF AIR IN A SMOOTH TUBE WITH HEAT TRANSFER WITH VARIABLE FLUID PROPERTIES. R. G. Deissler and C. S. Eian. February 1952. 43p. diagrs. (NACA TN 2629)

AN ANALYSIS OF LAMINAR FREE-CONVECTION FLOW AND HEAT TRANSFER ABOUT A FLAT PLATE PARALLEL TO THE DIRECTION OF THE GENERATING BODY FORCE. Simon Ostrach. February 1952. 47p. diagrs., tab. (NACA TN 2635)

INFLUENCE OF LUBRICANT VISCOSITY ON OPERATING TEMPERATURES OF 75-MILLIMETER-BORE CYLINDRICAL-ROLLER BEARING AT HIGH SPEEDS. E. Fred Macks, William J. Anderson and Zolton N. Nemeth. February 1952. 47p. diagrs., photo., 3 tabs. (NACA TN 2636)

PRELIMINARY INVESTIGATION OF CYCLIC DE-ICING OF AN AIRFOIL USING AN EXTERNAL ELECTRIC HEATER. James P. Lewis and Dean T. Bowden. February 1952. 43p. photos., diagrs. (NACA RM E51J30)

INVESTIGATION OF EFFECTIVE THERMAL CONDUCTIVITIES OF POWDERS. R. G. Deissler and C. S. Eian. June 1952. 44p. diagrs., tab. (NACA RM E52C05)

EXPERIMENTAL INVESTIGATION OF AVERAGE HEAT-TRANSFER AND FRICTION COEFFICIENTS FOR AIR FLOWING IN CIRCULAR TUBES HAVING SQUARE-THREAD-TYPE ROUGHNESS. Eldon W. Sams. June 1952. 43p. diagrs., photos. (NACA RM E52D17)

METHOD FOR CALCULATION OF HEAT TRANSFER IN LAMINAR REGION OF AIR FLOW AROUND CYLINDERS OF ARBITRARY CROSS SECTION (INCLUDING LARGE TEMPERATURE DIFFERENCES AND TRANSPIRATION COOLING). E. R. G. Eckert and John N. B. Livingood. June 1952. 71p. diagrs. (NACA TN 2733)

ANALYSIS OF FULLY DEVELOPED TURBULENT HEAT TRANSFER AT LOW PECLET NUMBERS IN SMOOTH TUBES WITH APPLICATION TO LIQUID METALS. Robert G. Deissler. August 1952. 20p. diagrs. (NACA RM E52F05)

SOLUTIONS OF LAMINAR-BOUNDARY-LAYER EQUATIONS WHICH RESULT IN SPECIFIC-WEIGHT-FLOW PROFILES LOCALLY EXCEEDING FREE-STREAM VALUES. W. Byron Brown and John N. B. Livingood. September 1952. 36p. diagrs., 2 tabs. (NACA TN 2800)

STUDY OF PRESSURE EFFECTS ON VAPORIZATION RATE OF DROPS IN GAS STREAMS. Robert D. Ingebo. January 1953. 36p. diagrs., 5 tabs. (NACA TN 2850)

FORCED-CONVECTION HEAT-TRANSFER CHARACTERISTICS OF MOLTEN SODIUM HYDROXIDE. Milton D. Grele and Louis Gedeon. February 1953. 27p. diagrs., photo., 2 tabs. (NACA RM E52L09)

HEAT AND MOMENTUM TRANSFER BETWEEN A SPHERICAL PARTICLE AND AIR STREAMS. Y. S. Tang, J. M. Duncan and H. E. Schwyer, University of Florida. March 1953. 48p. diagrs., photo., tab. (NACA TN 2867)

ANALYSIS OF HEAT TRANSFER AND FLUID FRICTION FOR FULLY DEVELOPED TURBULENT FLOW OF SUPERCRITICAL WATER WITH VARIABLE FLUID PROPERTIES IN A SMOOTH TUBE. Robert G. Deissler and Maynard F. Taylor. April 1953. 29p. diagrs. (NACA RM E53B17)

## HEAT EXCHANGERS

### (3.9.2)

TEMPERATURE DISTRIBUTION IN INTERNALLY HEATED WALLS OF HEAT EXCHANGERS COMPOSED OF NONCIRCULAR FLOW PASSAGES. E. R. G. Eckert and George M. Low. 1951. ii, 14p. diagrs. (NACA Rept. 1022. Formerly TN 2257)

TEMPERATURE DISTRIBUTION IN INTERNALLY HEATED WALLS OF HEAT EXCHANGERS WITH NONCIRCULAR FLOW PASSAGES USING COOLANTS WITH VERY LOW PRANDTL NUMBER. E. R. G. Eckert and George M. Low. July 1951. 29p. diagrs. (NACA TN 2401)

AN INVESTIGATION OF AIRCRAFT HEATERS. XXXIV - EXPERIMENTAL DETERMINATION OF THERMAL AND HYDRODYNAMICAL BEHAVIOR OF AIR FLOWING BETWEEN A FLAT AND A WAVE-SHAPED PLATE. L. M. K. Boelter, V. D. Sanders, G. Young, M. Morgan and E. H. Morrin, University of California. August 1951. 30p. diagrs. (NACA TN 2426)

AN INVESTIGATION OF AIRCRAFT HEATERS. XXXVI - PRELIMINARY INVESTIGATION OF A COMBUSTION-TYPE AIRCRAFT HEATER. L. M. K. Boelter, W. R. Elswick, V. D. Sanders and M. W. Rubesin, University of California. August 1951. 15p. diagrs. (NACA TN 2428)

ANALYTICAL METHOD FOR DETERMINING PERFORMANCE OF TURBOJET-ENGINE TAIL-PIPE HEAT EXCHANGERS. Michael Behun and Harrison C. Chandler, Jr. September 1951. 42p. diagrs. (NACA TN 2456)

AN INVESTIGATION OF AIRCRAFT HEATERS. XXXVII - EXPERIMENTAL DETERMINATION OF THERMAL AND HYDRODYNAMICAL BEHAVIOR OF AIR FLOWING ALONG A FLAT PLATE CONTAINING TURBULENCE PROMOTERS. L. M. K. Boelter, G. Young, M. L. Greenfield, V. D. Sanders and M. Morgan, University of California. October 1951. 26p. diagrs. (NACA TN 2517)

ICING PROTECTION FOR A TURBOJET TRANSPORT AIRPLANE: HEATING REQUIREMENTS, METHODS OF PROTECTION, AND PERFORMANCE PENALTIES. Thomas F. Gelder, James P. Lewis and Stanley L. Koutz. January 1953. i, 57p. diagrs., tab. (NACA TN 2866)

## Cooling of Engines

### (3.10)

#### RECIPROCATING ENGINES

##### (3.10.1)

NACA INVESTIGATION OF FUEL PERFORMANCE IN PISTON-TYPE ENGINES. Henry C. Barnett. 1951. vi, 102p. diagrs., photos., 32 tabs. (NACA Rept. 1026)

#### GAS-TURBINE SYSTEMS

##### (3.10.2)

COOLING OF GAS TURBINES. I - EFFECTS OF ADDITION OF FINS TO BLADE TIPS AND ROTOR, ADMISSION OF COOLING AIR THROUGH PART OF NOZZLES, AND CHANGE IN THERMAL CONDUCTIVITY OF TURBINE COMPONENTS. W. Byron Brown. February 11, 1947. 26p. diagrs. (NACA RM E7B11a) (Declassified from Restricted, 6/5/53)

COOLING OF GAS TURBINES. II - EFFECTIVENESS OF RIM COOLING OF BLADES. Lincoln Wolfenstein, Gene L. Meyer and John S. McCarthy. March 18, 1947. 31p. diagrs. (NACA RM E7B11b) (Declassified from Restricted, 6/5/53)

INVESTIGATION OF THRUST AUGMENTATION OF A 1600-POUND THRUST CENTRIFUGAL-FLOW-TYPE TURBOJET ENGINE BY INJECTION OF REFRIGERANTS AT COMPRESSOR INLETS. William L. Jones and Harry W. Dowman. August 25, 1947. 44p. diagrs., photo., tab. (NACA RM E7G23) (Declassified from Restricted, 6/5/53)

COOLING OF GAS TURBINES. IX - COOLING EFFECTS FROM USE OF CERAMIC COATINGS ON WATER-COOLED TURBINE BLADES. W. Byron Brown and John N. B. Livingood. October 13, 1948. 26p. diagrs. (NACA RM E8H03) (Declassified from Restricted, 6/11/53)

ANALYSIS OF TURBULENT FREE-CONVECTION BOUNDARY LAYER ON FLAT PLATE. E. R. G. Eckert and Thomas W. Jackson. 1951. 7p. diagrs. (NACA Rept. 1015. Formerly TN 2207)

AN ANALYSIS OF LAMINAR FREE-CONVECTION FLOW AND HEAT TRANSFER ABOUT A FLAT PLATE PARALLEL TO THE DIRECTION OF THE GENERATING BODY FORCE. Simon Ostrach. February 1952. 47p. diagrs., tab. (NACA TN 2635)

METHOD FOR CALCULATION OF HEAT TRANSFER IN LAMINAR REGION OF AIR FLOW AROUND CYLINDERS OF ARBITRARY CROSS SECTION (INCLUDING LARGE TEMPERATURE DIFFERENCES AND TRANSPIRATION COOLING). E. R. G. Eckert and John N. B. Livingood. June 1952. 71p. diagrs. (NACA TN 2733)

#### RAM JETS

##### (3.10.3)

AN ANALYSIS OF LAMINAR FREE-CONVECTION FLOW AND HEAT TRANSFER ABOUT A FLAT PLATE PARALLEL TO THE DIRECTION OF THE GENERATING BODY FORCE. Simon Ostrach. February 1952. 47p. diagrs., tab. (NACA TN 2635)

#### ROCKETS

##### (3.10.5)

INTERNAL-FILM COOLING OF ROCKET NOZZLES. J. L. Sloop and George R. Kinney. June 8, 1948. 40p. diagrs., photos. (NACA RM E8A29a) (Declassified from Restricted, 1/3/52)

A BIHARMONIC RELAXATION METHOD FOR CALCULATING THERMAL STRESS IN COOLED IRREGULAR CYLINDERS. Arthur G. Holms. 1952. ii, 19p. diagrs., 4 tabs. (NACA Rept. 1059. Formerly TN 2434)

INTERNAL-LIQUID-FILM-COOLING EXPERIMENTS WITH AIRSTREAM TEMPERATURES TO 2000° F IN 2- AND 4-INCH-DIAMETER HORIZONTAL TUBES. George R. Kinney, Andrew E. Abramson and John L. Sloop. 1952. ii, 21p. diagrs., photos., 5 tabs. (NACA Rept. 1087. Formerly RM E50F19; RM E51C13; RM E52B20)

## Properties of Gases

### (3.11)

PRELIMINARY INVESTIGATION OF HYDRAZINE AS A ROCKET FUEL. Paul M. Ordin, Riley O. Miller and John M. Diehl. May 24, 1948. 35p. diagrs., photos. (NACA RM E7H21) (Declassified from Confidential, 9/16/52)

EXPERIMENTAL DETERMINATION OF TIME CONSTANTS AND NUSSELT NUMBERS FOR BARE-WIRE THERMOCOUPLES IN HIGH-VELOCITY AIR STREAMS AND ANALYTIC APPROXIMATION OF CONDUCTION AND RADIATION ERRORS. Marvin D. Scadron and Isidore Warshawsky. January 1952. 81p. diagrs., 4 tabs. (NACA TN 2599)

MINIMUM IGNITION ENERGIES OF SIX PURE HYDROCARBON FUELS OF THE  $C_2$  AND  $C_6$  SERIES. Allen J. Metzler. August 1952. 22p. diagrs., 3 tabs. (NACA RM E52F27)

CALORIMETRIC DETERMINATION OF CONSTANT-PRESSURE SPECIFIC HEATS OF CARBON DIOXIDE AT ELEVATED PRESSURES AND TEMPERATURES. Virgil E. Schrock, University of California. December 1952. 46p. diagrs., 2 tabs. (NACA TN 2838)

### KINETIC

#### (3.11.1)

SOME MEASUREMENTS OF THE EFFECT OF GASEOUS IMPERFECTIONS ON THE CRITICAL PRESSURE RATIO IN AIR AND THE SPEED OF SOUND IN NITROGEN. Coleman duP. Donaldson and Jim J. Jones. August 1951. 15p. diagrs., photos., tab. (NACA TN 2437)

### THERMODYNAMIC

#### (3.11.2)

ANALYSIS OF THRUST AUGMENTATION OF TURBOJET ENGINES BY WATER INJECTION AT COMPRESSOR INLET INCLUDING CHARTS FOR CALCULATING COMPRESSION PROCESSES WITH WATER INJECTION. E. Clinton Wilcox and Arthur M. Trout. 1951. ii, 20p. diagrs. (NACA Rept. 1006. Formerly TN 2104; TN 2105)

GENERAL METHOD AND THERMODYNAMIC TABLES FOR COMPUTATION OF EQUILIBRIUM COMPOSITION AND TEMPERATURE OF CHEMICAL REACTIONS. Vearl N. Huff, Sanford Gordon and Virginia E. Morrell. 1951. ii, 57p., 45 tabs. (NACA Rept. 1037. Formerly NACA TN 2113, TN 2161)

HEAT AND MOMENTUM TRANSFER BETWEEN A SPHERICAL PARTICLE AND AIR STREAMS. Y. S. Tang, J. M. Duncan and H. E. Schweyer, University of Florida. March 1953. 48p. diagrs., photo., tab. (NACA TN 2867)

## **Accessories and Accessory Functions (3.12)**

### **FUEL SYSTEMS**

#### **(3.12.1)**

##### **ROCKET ENGINES**

###### **(3.12.1.8)**

COMBUSTION INSTABILITY IN AN ACID-HEPTANE ROCKET WITH A PRESSURIZED-GAS PROPELLANT PUMPING SYSTEM. Adelbert O. Tischler and Donald R. Bellman. May 1953. 50p. diagrs., photo. (NACA TN 2936. Formerly RM E51G11)

### **COOLING SYSTEMS**

#### **(3.12.5)**

USE OF A CONSOLIDATED POROUS MEDIUM FOR MEASUREMENT OF FLOW RATE AND VISCOSITY OF GASES AT ELEVATED PRESSURES AND TEMPERATURES. Martin B. Biles and J. A. Putnam, University of California. September 1952. 51p. diagrs., photos., 7 tabs. (NACA TN 2783)

## **Vibration and Flutter (3.13)**

COMBUSTION INSTABILITY IN AN ACID-HEPTANE  
ROCKET WITH A PRESSURIZED-GAS PROPELLANT  
PUMPING SYSTEM. Adelbert O. Tischler and  
Donald R. Bellman. May 1953. 50p. diags., photo.  
(NACA TN 2936. Formerly RM E51G11)



# **AIRCRAFT LOADS AND CONSTRUCTION**

## **(4)**

## Loads

### (4.1)

#### AERODYNAMIC

##### (4.1.1)

SOME PRELIMINARY RESULTS IN THE DETERMINATION OF AERODYNAMIC DERIVATIVES OF CONTROL SURFACES IN THE TRANSONIC SPEED RANGE BY MEANS OF A FLUSH-TYPE ELECTRICAL PRESSURE CELL. Albert L. Erickson and Robert C. Robinson. October 8, 1948. 40p. diags., photos., 3 tabs. (NACA RM A8H03) (Declassified from Confidential, 6/11/53)

METHOD OF ESTIMATING THE MINIMUM SIZE OF A TAIL OR WING-TIP PARACHUTE FOR EMERGENCY SPIN RECOVERY OF AN AIRPLANE. Frank S. Malvestuto, Jr. October 27, 1948. 42p. diags., photos., 4 tabs. (NACA RM L8D27) (Reclassified from Confidential, 7/3/51)

A METHOD FOR PREDICTING THE LOW-SPEED CHORDWISE PRESSURE DISTRIBUTION OVER SHARP-EDGE AIRFOIL SECTIONS WITH PLAIN FLAPS AT THE LEADING AND TRAILING EDGES. Robert J. Nuber and Jones F. Cahill. October 2, 1950. 28p. diags. (NACA RM L50H17a) (Declassified from Restricted, 2/28/52)

AN INVESTIGATION OF BENDING-MOMENT DISTRIBUTION ON A MODEL HELICOPTER ROTOR BLADE AND A COMPARISON WITH THEORY. John R. Meyer, Jr., Massachusetts Institute of Technology. February 1952. 91p. diags., photos, 12 tabs. (NACA TN 2626)

WING-BODY INTERFERENCE AT SUPERSONIC SPEEDS WITH AN APPLICATION TO COMBINATIONS WITH RECTANGULAR WINGS. Jack N. Nielsen and William C. Pitts. April 1952. 63p. diags., 2 tabs. (NACA TN 2677)

CALIBRATION OF STRAIN-GAGE INSTALLATIONS IN AIRCRAFT STRUCTURES FOR THE MEASUREMENT OF FLIGHT LOADS. T. H. Skopinski, William S. Aiken, Jr. and Wilber B. Huston. October 8, 1952. 71p. diags., 10 tabs. (NACA RM L52G31) (Declassified from Confidential, 6/29/53)

##### WINGS

###### (4.1.1.1)

INVESTIGATION OF THE CHARACTERISTICS OF A HIGH-ASPECT-RATIO WING IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Richard T. Whitcomb. August 28, 1946. 77p. diags., photos., 3 tabs. (NACA RM L6H28a) (Declassified from Restricted, 6/5/53)

AN INVESTIGATION OF A HIGH-ASPECT-RATIO WING HAVING 0.20-CHORD PLAIN AILERONS IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Arvo A. Luoma. August 28, 1946. 124p. diags., photos., 2 tabs. (NACA RM L6H28d) (Declassified from Restricted, 6/5/53)

WIND-TUNNEL INVESTIGATION OF HIGH-LIFT AND STALL-CONTROL DEVICES ON A 37° SWEEP-BACK WING OF ASPECT RATIO 6 AT HIGH REYNOLDS NUMBERS. William Koven and Robert R. Graham. September 2, 1948. 70p. diags., photos., tab. (NACA RM L8D29) (Declassified from Restricted, 6/29/53)

NACA RM L9G15  
National Advisory Committee for Aeronautics. INVESTIGATION AT LARGE SCALE OF THE PRESSURE DISTRIBUTION AND FLOW PHENOMENA OVER A WING WITH THE LEADING EDGE SWEEP BACK 47.5° HAVING CIRCULAR-ARC AIRFOIL SECTIONS AND EQUIPPED WITH DROOPED-NOSE AND PLAIN FLAPS. Roy H. Lange, Edward F. Whittle, Jr. and Marvin P. Fink. September 8, 1949. 72p. diags., 3 tabs. (NACA RM L9G15) (Declassified from Restricted, 6/29/53)

CALCULATION OF THE AERODYNAMIC LOADING OF SWEEP AND UNSWEEP FLEXIBLE WINGS OF ARBITRARY STIFFNESS. Franklin W. Diederich. 1950. ii, 29p. diags., 10 tabs. (NACA Rept. 1000. Formerly RM L8G27a, TN 1876)

A LIFT-CANCELLATION TECHNIQUE IN LINEARIZED SUPERSONIC-WING THEORY. Harold Mirels. 1951. ii, 11p. diags. (NACA Rept. 1004. Formerly TN 2145)

EFFECT OF WING FLEXIBILITY AND VARIABLE AIR LIFT UPON WING BENDING MOMENTS DURING LANDING IMPACT OF A SMALL SEAPLANE. Kenneth F. Merten and Edgar B. Beck. 1951. 7p. diags., 2 tabs. (NACA Rept. 1013. Formerly TN 2063)

CALCULATION OF THE LATERAL CONTROL OF SWEEP AND UNSWEEP FLEXIBLE WINGS OF ARBITRARY STIFFNESS. Franklin W. Diederich. 1951. ii, 19p. diags., 6 tabs. (NACA Rept. 1024. Formerly RM L8H24a)

FORMULAS FOR THE SUPERSONIC LOADING, LIFT AND DRAG OF FLAT SWEEP-BACK WINGS WITH LEADING EDGES BEHIND THE MACH LINES. Doris Cohen. 1951. iii, 40p. diags. (NACA Rept. 1050)

THEORETICAL ANTISYMMETRIC SPAN LOADING FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS. John DeYoung. 1951. 36p. diags., 9 tabs. (NACA Rept. 1056. Formerly TN 2140)

THEORETICAL SYMMETRIC SPAN LOADING DUE TO FLAP DEFLECTION FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS. John DeYoung. 1952. ii, 41p. diags., tabs. (NACA Rept. 1071. Formerly NACA TN 2278)

ELECTRICAL PRESSURE INTEGRATOR. Arleigh P. Helfer. January 1952. 44p. photos., diags., 2 tabs. (NACA TN 2607)

## LOADS AND CONSTRUCTION 138 LOADS (4.1)

### *Wings - Aerodynamic (Cont.)*

**CHARTS AND APPROXIMATE FORMULAS FOR THE ESTIMATION OF AEROELASTIC EFFECTS ON THE LOADING OF SWEPT AND UNSWEPT WINGS.** Franklin W. Diederich and Kenneth A. Foss. February 1952. 98p. diagrs., 3 tabs. (NACA TN 2608)

**CHARTS AND APPROXIMATE FORMULAS FOR THE ESTIMATION OF AEROELASTIC EFFECTS ON THE LATERAL CONTROL OF SWEPT AND UNSWEPT WINGS.** Kenneth A. Foss and Franklin W. Diederich. July 1952. 70p. diagrs., 2 tabs. (NACA TN 2747)

**A SIMPLE APPROXIMATE METHOD FOR CALCULATING SPANWISE LIFT DISTRIBUTIONS AND AERODYNAMIC INFLUENCE COEFFICIENTS AT SUBSONIC SPEEDS.** Franklin W. Diederich. August 1952. 63p. diagrs., tab. (NACA TN 2751)

**SPAN LOAD DISTRIBUTIONS RESULTING FROM CONSTANT ANGLE OF ATTACK, STEADY ROLLING VELOCITY, STEADY PITCHING VELOCITY, AND CONSTANT VERTICAL ACCELERATION FOR TAPERED SWEPTBACK WINGS WITH STREAMWISE TIPS. SUBSONIC LEADING EDGES AND SUPERSONIC TRAILING EDGES.** Margery E. Hannah and Kenneth Margolis. December 1952. 221p. diagrs., 4 tabs. (NACA TN 2831)

**A SIMPLIFIED MATHEMATICAL MODEL FOR CALCULATING AERODYNAMIC LOADING AND DOWNWASH FOR MIDWING WING-FUSELAGE COMBINATIONS WITH WINGS OF ARBITRARY PLAN FORM.** Martin Zlotnick and Samuel W. Robinson, Jr. January 16, 1953. 36p. diagrs. (NACA RM L52J27a) (Declassified from Restricted, 4/10/53)

**A METHOD FOR CALCULATING THE AERODYNAMIC LOADING ON WING-TIP-TANK COMBINATIONS IN SUBSONIC FLOW.** Samuel W. Robinson, Jr. and Martin Zlotnick. April 7, 1953. 43p. diagrs. (NACA RM L53B18) (Declassified from Restricted, 4/9/53)

### Steady Loads (4.1.1.1.1)

**AERODYNAMIC LOAD MEASUREMENTS OVER LEADING-EDGE AND TRAILING-EDGE PLAIN FLAPS ON A 6-PERCENT THICK SYMMETRICAL CIRCULAR-ARC AIRFOIL SECTION.** William J. Underwood and Robert J. Nuber. October 22, 1947. 43p. diagrs., photos., 2 tabs. (NACA RM L7H04) (Reclassified from Restricted, 7/3/51)

**CHORDWISE AND SPANWISE LOADINGS MEASURED AT LOW SPEED ON LARGE TRIANGULAR WINGS.** Adrien E. Anderson. April 19, 1949. 78p. diagrs., photos., 2 tabs. (NACA RM A9B17) (Declassified from Restricted, 6/11/53)

**A DESIGN STUDY OF LEADING-EDGE INLETS FOR UNSWEPT WINGS.** Robert E. Dannenberg. June 30, 1950. 56p. diagrs., photos., 3 tabs. (NACA RM A9K02b) (Declassified from Restricted, 6/11/53)

**GENERALIZED CONICAL-FLOW FIELDS IN SUPERSONIC WING THEORY.** Harvard Lomax and Max A. Heaslet. September 1951. 45p. diagrs. (NACA TN 2497)

**EFFECTS OF FINITE SPAN ON THE SECTION CHARACTERISTICS OF TWO 45° SWEPT-BACK WINGS OF ASPECT RATIO 6.** Lynn W. Hunton. March 17, 1952. 34p. diagrs. (NACA RM A52A10) (Declassified from Restricted, 4/10/53)

**WING-BODY INTERFERENCE AT SUPERSONIC SPEEDS WITH AN APPLICATION TO COMBINATIONS WITH RECTANGULAR WINGS.** Jack N. Nielsen and William C. Pitts. April 1952. 63p. diagrs., 2 tabs. (NACA TN 2677)

**RECIPROCITY RELATIONS IN AERODYNAMICS.** Max A. Heaslet and John R. Spreiter. May 1952. 38p. diagrs. (NACA TN 2700)

**SPAN LOAD DISTRIBUTIONS RESULTING FROM ANGLE OF ATTACK, ROLLING, AND PITCHING FOR TAPERED SWEPTBACK WINGS WITH STREAMWISE TIPS. SUPERSONIC LEADING AND TRAILING EDGES.** John C. Martin and Isabella Jeffreys. July 1952. 143p. diagrs., 6 tabs. (NACA TN 2643)

**STEADY VIBRATIONS OF WING OF CIRCULAR PLAN FORM.** (Ob ustanovivshikhsya kolebaniyakh kryla krugovoi formy v plane). THEORY OF WING OF CIRCULAR PLAN FORM. (Teoriya kryla konechnogo razmakha krugovoi formy v plane). N. E. Kochin. January 1953. 93p. diagrs. (NACA TM 1324. Trans. from: Prikladnaya Matematika i Mekhanika, v. 6, no. 4, 1942, p. 287-316; Prikladnaya Matematika i Mekhanika, v. 4, no. 1, 1940, p. 3-32).

**THEORETICAL CALCULATION OF THE PRESSURE DISTRIBUTION, SPAN LOADING, AND ROLLING MOMENT DUE TO SIDESLIP AT SUPERSONIC SPEEDS FOR THIN SWEPTBACK TAPERED WINGS WITH SUPERSONIC TRAILING EDGES AND WING TIPS PARALLEL TO THE AXIS OF WING SYMMETRY.** Kenneth Margolis, Windsor L. Sherman and Margery E. Hannah. February 1953. 70p. diagrs., tab. (NACA TN 2898)

### Maneuvering (4.1.1.1.2)

**HORIZONTAL TAIL LOADS IN MANEUVERING FLIGHT.** Henry A. Pearson, William A. McGowan and James J. Donegan. 1951. ii, 12p. diagrs., 2 tabs. (NACA Rept. 1007. Formerly TN 2078)

**THREE-DIMENSIONAL UNSTEADY LIFT PROBLEMS IN HIGH-SPEED FLIGHT - THE TRIANGULAR WING.** Harvard Lomax, Max A. Heaslet and Franklyn B. Fuller. June 1951. 62p. diagrs. (NACA TN 2387)

**THE INDICIAL LIFT AND PITCHING MOMENT FOR A SINKING OR PITCHING TWO-DIMENSIONAL WING FLYING AT SUBSONIC OR SUPERSONIC SPEEDS.** Harvard Lomax, Max A. Heaslet and Loma Sluder. July 1951. 56p. diagrs., tab. (NACA TN 2403)

**FLIGHT INVESTIGATION OF SOME FACTORS AFFECTING THE CRITICAL TAIL LOADS ON LARGE AIRPLANES.** Harvey H. Brown. September 1951. 119p. diagrs., photos., 2 tabs. (NACA TN 2490)

**THE EFFECT OF RATE OF CHANGE OF ANGLE OF ATTACK ON THE MAXIMUM LIFT COEFFICIENT OF A PURSUIT AIRPLANE.** Burnett L. Gadeberg. October 1951. 17p. diagrs., photo. (NACA TN 2525. Formerly RM A8130)

**Maneuvering, Wings - Aerodynamic  
(Cont.)**

EXPERIMENTAL INVESTIGATION OF ROLLING PERFORMANCE OF STRAIGHT AND SWEEPBACK FLEXIBLE WINGS WITH VARIOUS AILERONS. Henry A. Cole, Jr. and Victor M. Ganzer, University of Washington. December 1951. 45p. diagrs., photos., 2 tabs. (NACA TN 2563)

MATRIX METHOD OF DETERMINING THE LONGITUDINAL-STABILITY COEFFICIENTS AND FREQUENCY RESPONSE OF AN AIRCRAFT FROM TRANSIENT FLIGHT DATA. James J. Donegan and Henry A. Pearson. 1952. ii, 11p. diagrs., 3 tabs. (NACA Rept. 1070. Formerly TN 2370)

RECIPROCITY RELATIONS IN AERODYNAMICS. Max. A. Heaslet and John R. Spreiter. May 1952. 38p. diagrs. (NACA TN 2700)

MATRIX METHODS FOR DETERMINING THE LONGITUDINAL-STABILITY DERIVATIVES OF AN AIRPLANE FROM TRANSIENT FLIGHT DATA. James J. Donegan. March 1953. 65p. diagrs., 6 tabs. (NACA TN 2902)

**Gust Loads  
(4.1.1.1.3)**

SUMMARY OF INFORMATION RELATING TO GUST LOADS ON AIRPLANES. Philip Donely. 1950. iii, 51p. diagrs., photos., 21 tabs. (NACA Rept. 997. Formerly TN 1976)

A RECURRENCE MATRIX SOLUTION FOR THE DYNAMIC RESPONSE OF AIRCRAFT IN GUSTS. John C. Houbolt. 1951. ii, 31p. diagrs., 7 tabs. (NACA Rept. 1010. Formerly NACA TN 2060)

FLIGHT INVESTIGATION OF THE EFFECT OF TRANSIENT WING RESPONSE ON WING STRAINS OF A TWIN-ENGINE TRANSPORT AIRPLANE IN ROUGH AIR. Harry C. Mickleboro and C. C. Shufflebarger. July 1951. 21p. diagrs., 2 tabs. (NACA TN 2424)

AN INVESTIGATION OF A METHOD TO INDICATE ATMOSPHERIC TURBULENCE FROM AN AIRPLANE IN FLIGHT. H. B. Tolefson and C. A. Gurtler. July 1951. 18p. diagrs., photo., tab. (NACA RM L50K29a)

INVESTIGATION OF THE FATIGUE STRENGTH OF FULL-SCALE AIRPLANE WING STRUCTURES. Dwight O. Fearnow. July 1951. 30p. diagrs., photos., 3 tabs. (NACA RM L51D13a)

A RELATION OF WIND SHEAR AND INSOLATION TO THE TURBULENCE ENCOUNTERED BY AN AIRPLANE IN CLEAR-AIR FLIGHT AT LOW ALTITUDES. James K. Thompson. September 1951. 12p. diagrs., tab. (NACA RM L51H07)

FLIGHT INVESTIGATION OF THE EFFECT OF ATMOSPHERIC TURBULENCE ON THE CLIMB PERFORMANCE OF AN AIRPLANE. Harry Press and Herbert C. McClanahan, Jr. October 1951. 30p. diagrs., 5 tabs. (NACA TN 2498)

INFLUENCE OF STATIC LONGITUDINAL STABILITY ON THE BEHAVIOR OF AIRPLANES IN GUSTS. (Einfluss der statischen Längsstabilität auf das Verhalten eines Flugzeuges in Böen). H. Hoene. November 1951. 26p. diagrs. (NACA TM 1323. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1422, December 31, 1940).

NUMERICAL DETERMINATION OF INDICIAL LIFT OF TWO-DIMENSIONAL AIRFOILS AT SUBSONIC MACH NUMBERS FROM OSCILLATORY LIFT COEFFICIENTS WITH CALCULATIONS FOR MACH NUMBER 0.7. Bernard Mazelsky. December 1951. 38p. diagrs., tab. (NACA TN 2562)

A FLIGHT INVESTIGATION OF THE EFFECT OF CENTER-OF-GRAVITY LOCATION ON GUST LOADS. Jack Funk and Earle T. Binckley. December 1951. 18p. diagrs., 3 tabs. (NACA TN 2575)

DETERMINATION OF INDICIAL LIFT AND MOMENT OF A TWO-DIMENSIONAL PITCHING AIRFOIL AT SUBSONIC MACH NUMBERS FROM OSCILLATORY COEFFICIENTS WITH NUMERICAL CALCULATIONS FOR A MACH NUMBER OF 0.7. Bernard Mazelsky. February 1952. 30p. diagrs., tab. (NACA TN 2613)

SUMMARY OF ACCELERATION AND AIRSPEED DATA FROM COMMERCIAL TRANSPORT AIRPLANES DURING THE PERIOD FROM 1933 TO 1945. Walter G. Walker and Roy Steiner. February 1952. 30p. diagrs., 5 tabs. (NACA TN 2625)

AN APPROACH TO THE PREDICTION OF THE FREQUENCY DISTRIBUTION OF GUST LOADS ON AIRPLANES IN NORMAL OPERATIONS. Harry Press. April 1952. 34p. diagrs., 2 tabs. (NACA TN 2660)

THE GUST AND GUST-LOAD EXPERIENCE OF A TWIN-ENGINE LOW-ALTITUDE TRANSPORT AIRPLANT IN OPERATION ON A NORTHERN TRANSCONTINENTAL ROUTE. Harry Press and Robert L. McDougal. April 1952. 33p. diagrs., 8 tabs. (NACA TN 2663)

GUST-TUNNEL INVESTIGATION OF DELTA-WING MODEL WITH THE LEADING EDGE SWEEP BACK 60°. Harold B. Pierce and Slaton L. Johns. April 1952. 12p. diagrs., photo., 3 tabs. (NACA RM L52B04)

RECIPROCITY RELATIONS IN AERODYNAMICS. Max. A. Heaslet and John R. Spreiter. May 1952. 38p. diagrs. (NACA TN 2700)

NORMAL ACCELERATIONS AND ASSOCIATED OPERATING CONDITIONS ON FOUR TYPES OF COMMERCIAL TRANSPORT AIRPLANES FROM VGH DATA AVAILABLE AS OF SEPTEMBER 1951. Roy Steiner and Doris A. Persh. May 1952. 8p. diagrs., 5 tabs. (NACA RM L52A28)

AN ANALYSIS OF THE NORMAL ACCELERATIONS AND AIRSPEEDS OF A TWO-ENGINE TYPE OF TRANSPORT AIRPLANE IN COMMERCIAL OPERATIONS ON ROUTES IN THE CENTRAL UNITED STATES FROM 1948 TO 1950. Walter G. Walker and Paul W. J. Schumacher. July 1952. 30p. diagrs., 4 tabs. (NACA TN 2735)

NUMERICAL DETERMINATION OF INDICIAL LIFT AND MOMENT FUNCTIONS FOR A TWO-DIMENSIONAL SINKING AND PITCHING AIRFOIL AT MACH NUMBERS 0.5 AND 0.6. Bernard Mazelsky and Joseph A. Drischler. July 1952. 37p. diagrs., 4 tabs. (NACA TN 2739)

GUST-RESPONSE ANALYSIS OF AN AIRPLANE INCLUDING WING BENDING FLEXIBILITY. John C. Houbolt and Eldon E. Kordes. August 1952. 48p. diagrs., 3 tabs. (NACA TN 2763)

## LOADS AND CONSTRUCTION 140 LOADS (4.1)

### *Gust, Wings - Aerodynamic (Cont.)*

FLIGHT INVESTIGATION OF TRANSIENT WING RESPONSE ON A FOUR-ENGINE BOMBER AIRPLANE IN ROUGH AIR WITH RESPECT TO CENTER-OF-GRAVITY ACCELERATIONS. Harry C. Mickleboro, Richard B. Fahrner and C. C. Shufflebarger. September 1952. 25p. diagrs., 3 tabs. (NACA TN 2780)

SOME DYNAMIC EFFECTS OF FUEL MOTION IN SIMPLIFIED MODEL TIP TANKS ON SUDDENLY EXCITED BENDING OSCILLATIONS. Kenneth F. Merten and Bertrand H. Stephenson. September 1952. 35p. diagrs., photos., 2 tabs. (NACA TN 2789)

AN ANALYSIS OF NORMAL ACCELERATIONS AND AIRSPEEDS OF ONE TYPE OF TWIN-ENGINE TRANSPORT AIRPLANE IN COMMERCIAL OPERATIONS OVER A NORTHERN TRANSCONTINENTAL ROUTE. Roy Steiner. November 1952. 23p. diagrs., 4 tabs. (NACA TN 2833)

A STUDY OF THE APPLICATION OF POWER-SPECTRAL METHODS OF GENERALIZED HARMONIC ANALYSIS TO GUST LOADS ON AIRPLANES. Harry Press and Bernard Mazelsky. January 1953. 48p. diagrs., 2 tabs. (NACA TN 2853)

EVALUATION OF GUST RESPONSE CHARACTERISTICS OF SOME EXISTING AIRCRAFT WITH WING BENDING FLEXIBILITY INCLUDED. Eldon E. Kordes and John C. Houbolt. February 1953. 31p. diagrs., 2 tabs. (NACA TN 2897)

INTERIM REPORT ON A FATIGUE INVESTIGATION OF A FULL-SCALE TRANSPORT AIRCRAFT WING STRUCTURE. M. James McGuigan, Jr. April 1953. 36p. photos., diagrs., 2 tabs. (NACA TN 2920)

LIFT DEVELOPED ON UNRESTRAINED RECTANGULAR WINGS ENTERING GUSTS AT SUBSONIC AND SUPERSONIC SPEEDS. Harvard Lomax. April 1953. 44p. diagrs., 2 tabs. (NACA TN 2925)

### TAIL (4.1.1.2)

INVESTIGATION AT HIGH SPEEDS OF A HORIZONTAL-TAIL MODEL IN THE LANGLEY 8-FOOT HIGH-SPEED TUNNEL. Ralph P. Bielat. January 31, 1947. 102p. diagrs., 3 tabs. (NACA RM L6L10b) (Declassified from Restricted, 6/5/53)

THEORETICAL FORCE AND MOMENTS DUE TO SIDESLIP OF A NUMBER OF VERTICAL TAIL CONFIGURATIONS AT SUPERSONIC SPEEDS. John C. Martin and Frank S. Malvestuto, Jr. September 1951. 60p. diagrs., photos. (NACA TN 2412)

A VECTOR STUDY OF LINEARIZED SUPERSONIC FLOW APPLICATIONS TO NONPLANAR PROBLEMS. John C. Martin. June 1952. 81p. diagrs., tab. (NACA TN 2641)

### Steady Loads (4.1.1.2.1)

WIND-TUNNEL INVESTIGATION OF THE CONTRIBUTION OF A VERTICAL TAIL TO THE DIRECTIONAL STABILITY OF A FIGHTER-TYPE AIRPLANE. Alfred A. Marino and N. Mastrocola. January 1952. 41p. diagrs., photo., 4 tabs. (NACA TN 2488. Formerly RM L7K03)

EFFECT OF HORIZONTAL-TAIL SPAN AND VERTICAL LOCATION ON THE AERODYNAMIC CHARACTERISTICS OF AN UNSWEPT TAIL ASSEMBLY IN SIDESLIP. Donald R. Riley. February 1953. 39p. diagrs., photos., tab. (NACA TN 2907)

### Maneuvering (4.1.1.2.2)

HORIZONTAL TAIL LOADS IN MANEUVERING FLIGHT. Henry A. Pearson, William A. McGowan and James J. Donegan. 1951. ii, 12p. diagrs., 2 tabs. (NACA Rept. 1007. Formerly TN 2078)

FLIGHT INVESTIGATION OF SOME FACTORS AFFECTING THE CRITICAL TAIL LOADS ON LARGE AIRPLANES. Harvey H. Brown. September 1951. 118p. diagrs., photos., 2 tabs. (NACA TN 2490)

MATRIX METHOD OF DETERMINING THE LONGITUDINAL-STABILITY COEFFICIENTS AND FREQUENCY RESPONSE OF AN AIRCRAFT FROM TRANSIENT FLIGHT DATA. James J. Donegan and Henry A. Pearson. 1952. ii, 11p. diagrs., 3 tabs. (NACA Rept. 1070. Formerly TN 2370)

ESTIMATION OF THE MAXIMUM ANGLE OF SIDESLIP FOR DETERMINATION OF VERTICAL-TAIL LOADS IN ROLLING MANEUVERS. Ralph W. Stone, Jr. February 1952. 46p. diagrs., 4 tabs. (NACA TN 2633)

ON THE USE OF A DAMPED SINE-WAVE ELEVATOR MOTION FOR COMPUTING THE DESIGN MANEUVERING HORIZONTAL-TAIL LOAD. Melvin Sadoff. January 1953. 32p. diagrs., 3 tabs. (NACA TN 2877)

MATRIX METHODS FOR DETERMINING THE LONGITUDINAL-STABILITY DERIVATIVES OF AN AIRPLANE FROM TRANSIENT FLIGHT DATA. James J. Donegan. March 1953. 65p. diagrs., 6 tabs. (NACA TN 2902)

### Buffeting and Gust (4.1.1.2.3)

EFFECT OF MACH NUMBER ON THE MAXIMUM LIFT AND BUFFETING BOUNDARY DETERMINED IN FLIGHT ON A NORTH AMERICAN P-51D AIRPLANE. John P. Mayer. June 12, 1947. 19p. diagrs., photo. (NACA RM L6I10) (Reclassified from Confidential, 7/3/51)

EFFECT OF CHORDWISE VANES ON AMPLITUDE OF TAIL BUFFETING. Allen R. Stokke. November 10, 1947. 10p. diagrs., photos. (NACA RM L7H11) (Reclassified from Confidential, 7/3/51)

SUMMARY OF INFORMATION RELATING TO GUST LOADS ON AIRPLANES. Philip Donely. 1950. iii, 51p. diagrs., photos., 21 tabs. (NACA Rept. 997. Formerly TN 1976)

FUSELAGE, NACELLES,  
AND CANOPIES  
(4.1.1.3)

CORRELATION OF WIND-TUNNEL AND FLIGHT DETERMINATIONS OF THE BUFFET SPEED OF AN AIRPLANE EQUIPPED WITH EXTERNAL STORES. H. Norman Silvers and Kenneth P. Spreemann. March 2, 1948. 54p. diagrs., photos., tab. (NACA RM L7E20) (Declassified from Restricted, 9/16/52)

PRESSURE DISTRIBUTIONS ON THIN CONICAL BODY OF ELLIPTIC CROSS SECTION AT MACH NUMBER 1.89. Stephen H. Maslen. January 20, 1949. 18p. diagrs., photo. (NACA RM E8K05) (Declassified from Confidential, 6/11/53)

WIND-TUNNEL INVESTIGATION OF THE CONTRIBUTION OF A VERTICAL TAIL TO THE DIRECTIONAL STABILITY OF A FIGHTER-TYPE AIRPLANE. Alfred A. Marino and N. Mastrocola. January 1952. 41p. diagrs., photo., 4 tabs. (NACA TN 2488. Formerly RM L7K03)

A COMPARISON OF THE EXPERIMENTAL SUBSONIC PRESSURE DISTRIBUTIONS ABOUT SEVERAL BODIES OF REVOLUTION WITH PRESSURE DISTRIBUTIONS COMPUTED BY MEANS OF THE LINEARIZED THEORY. Clarence W. Matthews. February 1952. 52p. diagrs., tab. (NACA TN 2519. Formerly RM L9F28)

APPROXIMATE THEORY FOR CALCULATION OF LIFT OF BODIES, AFTERBODIES, AND COMBINATIONS OF BODIES. Barry Moskowitz. April 1952. 39p. diagrs. (NACA TN 2669)

A SIMPLIFIED MATHEMATICAL MODEL FOR CALCULATING AERODYNAMIC LOADING AND DOWNWASH FOR MIDWING WING-FUSELAGE COMBINATIONS WITH WINGS OF ARBITRARY PLAN FORM. Martin Zlotnick and Samuel W. Robinson, Jr. January 16, 1953. 36p. diagrs. (NACA RM L52J27a) (Declassified from Restricted, 4/10/53)

A METHOD FOR CALCULATING THE AERODYNAMIC LOADING ON WING-TIP-TANK COMBINATIONS IN SUBSONIC FLOW. Samuel W. Robinson, Jr. and Martin Zlotnick. April 7, 1953. 43p. diagrs. (NACA RM L53B18) (Declassified from Restricted, 4/9/53)

ROTATING WINGS  
(4.1.1.4)

AN EXTENSION OF LIFTING ROTOR THEORY TO COVER OPERATION AT LARGE ANGLES OF ATTACK AND HIGH INFLOW CONDITIONS. Alfred Gessow and Almer D. Crim. April 1952. 36p. diagrs. (NACA TN 2665)

NORMAL ACCELERATIONS AND OPERATING CONDITIONS ENCOUNTERED BY A HELICOPTER IN AIR-MAIL OPERATIONS. Almer D. Crim and Marlin E. Hazen. June 1952. 17p. diagrs., photos., 2 tabs. (NACA TN 2714)

AN INVESTIGATION OF THE EXPERIMENTAL AERODYNAMIC LOADING ON A MODEL HELICOPTER ROTOR BLADE. John R. Meyer, Jr. and Gaetano Falabella, Jr., Massachusetts Institute of Technology. May 1953. 110p. diagrs., photos. (NACA TN 2953)

AEROELASTICITY  
(4.1.1.5)

CALCULATION OF THE LATERAL CONTROL OF SWEEP AND UNSWEEP FLEXIBLE WINGS OF ARBITRARY STIFFNESS. Franklin W. Diederich. 1951. ii, 19p. diagrs., 6 tabs. (NACA Rept. 1024. Formerly RM L8H24a)

FLIGHT INVESTIGATION OF THE EFFECT OF TRANSIENT WING RESPONSE ON WING STRAINS OF A TWIN-ENGINE TRANSPORT AIRPLANE IN ROUGH AIR. Harry C. Mickleboro and C. C. Shufflebarger. July 1951. 21p. diagrs., 2 tabs. (NACA TN 2424)

A SIMPLE APPROXIMATE METHOD FOR CALCULATING SPANWISE LIFT DISTRIBUTIONS AND AERODYNAMIC INFLUENCE COEFFICIENTS AT SUBSONIC SPEEDS. Franklin W. Diederich. August 1952. 63p. diagrs., tab. (NACA TN 2751)

FLIGHT INVESTIGATION OF TRANSIENT WING RESPONSE ON A FOUR-ENGINE BOMBER AIRPLANE IN ROUGH AIR WITH RESPECT TO CENTER-OF-GRAVITY ACCELERATIONS. Harry C. Mickleboro, Richard B. Fahrer and C. C. Shufflebarger. September 1952. 25p. diagrs., 3 tabs. (NACA TN 2780)

EVALUATION OF GUST RESPONSE CHARACTERISTICS OF SOME EXISTING AIRCRAFT WITH WING BENDING FLEXIBILITY INCLUDED. Eldon E. Kordes and John C. Houbolt. February 1953. 31p. diagrs., 2 tabs. (NACA TN 2897)

LANDING  
(4.1.2)

EVALUATION OF THE REDUCED-MASS METHOD OF REPRESENTING WING-LIFT EFFECTS IN FREE-FALL DROP TESTS OF LANDING GEARS. Benjamin Milwitzky and Dean C. Lindquist. July 1951. 43p. diagrs., photo., 3 tabs. (NACA TN 2400)

EFFECTS OF WING LIFT AND WEIGHT ON LANDING-GEAR LOADS. Dean C. Lindquist. March 1952. 42p. diagrs., photo., tab. (NACA TN 2645)

AN AIRBORNE INDICATOR FOR MEASURING VERTICAL VELOCITY OF AIRPLANES AT WHEEL CONTACT. Robert C. Dreher. February 1953. 19p. diagrs., photos. (NACA TN 2906)

IMPACT  
(4.1.2.1)

ON TRAVELING WAVES IN BEAMS. Robert W. Leonard and Bernard Budiansky. January 1953. 76p. diagrs., tab. (NACA TN 2874)

LOADS AND CONSTRUCTION  
142 LOADS (4.1)

Land  
(4.1.2.1.1)

EVALUATION OF THE REDUCED-MASS METHOD OF REPRESENTING WING-LIFT EFFECTS IN FREE-FALL DROP TESTS OF LANDING GEARS. Benjamin Milwitzky and Dean C. Lindquist. July 1951. 43p. diagrs., photo., 3 tabs. (NACA TN 2400)

INVESTIGATION OF THE AIR-COMPRESSION PROCESS DURING DROP TESTS OF AN OLEO-PNEUMATIC LANDING GEAR. James H. Walls. September 1951. 17p. diagrs., photo. (NACA TN 2477)

AN IMPULSE-MOMENTUM METHOD FOR CALCULATING LANDING-GEAR CONTACT CONDITIONS IN ECCENTRIC LANDINGS. Robert T. Yntema and Benjamin Milwitzky. January 1952. 60p. diagrs., 3 tabs. (NACA TN 2596)

EFFECTS OF WING LIFT AND WEIGHT ON LANDING-GEAR LOADS. Dean C. Lindquist. March 1952. 42p. diagrs., photo., tab. (NACA TN 2645)

NORMAL ACCELERATIONS AND OPERATING CONDITIONS ENCOUNTERED BY A HELICOPTER IN AIR-MAIL OPERATIONS. Almer D. Crim and Marlin E. Hazen. June 1952. 17p. diagrs., photos., 2 tabs. (NACA TN 2714)

ANALYSIS OF LANDING-GEAR BEHAVIOR. Benjamin Milwitzky and Francis E. Cook. August 1952. 98p. diagrs., photo., 3 tabs. (NACA TN 2755)

LANDING-GEAR IMPACT. W. Flüge, Stanford University. October 1952. 91p. diagrs., 9 tabs. (NACA TN 2743)

AN AIRBORNE INDICATOR FOR MEASURING VERTICAL VELOCITY OF AIRPLANES AT WHEEL CONTACT. Robert C. Dreher. February 1953. 19p. diagrs., photos. (NACA TN 2906)

Water  
(4.1.2.1.2)

EFFECT OF AN INCREASE IN HULL LENGTH-BEAM RATIO FROM 15 TO 20 ON THE HYDRODYNAMIC CHARACTERISTICS OF FLYING BOATS. Arthur W. Carter and Walter E. Whitaker, Jr. August 24, 1949. 29p. diagrs., photos., 2 tabs. (NACA RM L9G05) (Declassified from Restricted, 9/16/52)

EFFECT OF WING FLEXIBILITY AND VARIABLE AIR LIFT UPON WING BENDING MOMENTS DURING LANDING IMPACT OF A SMALL SEAPLANE. Kenneth F. Merten and Edgar B. Beck. 1951. 7p. diagrs., 2 tabs. (NACA Rept. 1013. Formerly TN 2063)

AN EXPERIMENTAL STUDY OF WATER-PRESSURE DISTRIBUTIONS DURING LANDINGS AND PLANING OF A HEAVILY LOADED RECTANGULAR FLAT-PLATE MODEL. Robert F. Smiley. September 1951. 40p. diagrs., 3 tabs. (NACA TN 2453)

A SEMIEMPIRICAL PROCEDURE FOR COMPUTING THE WATER-PRESSURE DISTRIBUTION ON FLAT AND V-BOTTOM PRISMATIC SURFACES DURING IMPACT OR PLANING. Robert F. Smiley. December 1951. 28p. diagrs. (NACA TN 2583)

HYDRODYNAMIC IMPACT OF A SYSTEM WITH A SINGLE ELASTIC MODE. I - THEORY AND GENERALIZED SOLUTION WITH AN APPLICATION TO AN ELASTIC AIRFRAME. Wilbur L. Mayo. 1952. ii, 17p. diagrs., 2 tabs. (NACA Rept. 1074. Formerly TN 1398)

HYDRODYNAMIC IMPACT OF A SYSTEM WITH A SINGLE ELASTIC MODE. II-COMPARISON OF EXPERIMENTAL FORCE AND RESPONSE WITH THEORY. Robert W. Miller and Kenneth F. Merten. 1952. ii, 7p. diagrs., photos., tab. (NACA Rept. 1075. Formerly TN 2343)

LANDING CHARACTERISTICS IN WAVES OF THREE DYNAMIC MODELS OF FLYING BOATS. James M. Benson, Robert F. Havens and David R. Woodward. January 1952. 41p. diagrs., photo., 2 tabs. (NACA TN 2508. Formerly RM L6L13)

THEORETICAL ANALYSIS OF HYDRODYNAMIC IMPACT OF A PRISMATIC FLOAT HAVING FREEDOM IN TRIM. Robert W. Miller. June 1952. 31p. diagrs., 2 tabs. (NACA TN 2698)

THEORY AND PROCEDURE FOR DETERMINING LOADS AND MOTIONS IN CHINE-IMMERSED HYDRODYNAMIC IMPACTS OF PRISMATIC BODIES. Emanuel Schnitzer. November 1952. 51p. diagrs. (NACA TN 2813)

THE APPLICATION OF PLANING CHARACTERISTICS TO THE CALCULATION OF THE WATER-LANDING LOADS AND MOTIONS OF SEAPLANES OF ARBITRARY CONSTANT CROSS SECTION. Robert F. Smiley. November 1952. 37p. diagrs. (NACA TN 2814)

A THEORETICAL INVESTIGATION OF THE EFFECT OF PARTIAL WING LIFT ON HYDRODYNAMIC LANDING CHARACTERISTICS OF V-BOTTOM SEAPLANES IN STEP IMPACTS. Joseph L. Sims and Emanuel Schnitzer. November 1952. 20p. diagrs. (NACA TN 2815)

WATER-PRESSURE DISTRIBUTIONS DURING LANDINGS OF A PRISMATIC MODEL HAVING AN ANGLE OF DEAD RISE OF  $22\frac{1}{2}^\circ$  AND BEAM-LOADING COEFFICIENTS OF 0.48 AND 0.97. Robert F. Smiley. November 1952. 37p. diagrs., 6 tabs. (NACA TN 2816)

A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF YAW ON PRESSURES, FORCES, AND MOMENTS DURING SEAPLANE LANDINGS AND PLANING. Robert F. Smiley. November 1952. 98p. diagrs., 7 tabs. (NACA TN 2817)

ESTIMATION OF HYDRODYNAMIC IMPACT LOADS AND PRESSURE DISTRIBUTIONS ON BODIES APPROXIMATING ELLIPTICAL CYLINDERS WITH SPECIAL REFERENCE TO WATER LANDINGS OF HELICOPTERS. Emanuel Schnitzer and Melvin E. Hathaway. April 1953. 31p. diagrs. (NACA TN 2889)

*Water - Impact Landing (Cont.)*

WATER-LANDING INVESTIGATION OF A FLAT-BOTTOM V-STEP MODEL AND COMPARISON WITH A THEORY INCORPORATING PLANING DATA. Robert W. Miller. May 1953. 23p. diagrs., photo., 2 tabs. (NACA TN 2932)

GROUND-RUN  
(4.1.2.2)

ANALYTICAL STUDY OF SHIMMY OF AIRPLANE WHEELS. (Etude Theorique du Shimmy des Roues d'Avion). Christian Bourcier de Carbon. September 1952. 126p. diagrs., photos. (NACA TM 1337. Trans. from Office National d'Etudes et de Recherches Aéronautiques, Pub. 7, 1948).

Land  
(4.1.2.2.1)

LANDING-GEAR IMPACT. W. Flüge, Stanford University. October 1952. 91p. diagrs., 9 tabs. (NACA TN 2743)

STATIC FORCE-DEFLECTION CHARACTERISTICS OF SIX AIRCRAFT TIRES UNDER COMBINED LOADING. Walter B. Horne. May 1953. 92p. diagrs., photos., 2 tabs. (NACA TN 2926)

Water  
(4.1.2.2.2)

THEORETICAL ANALYSIS OF HYDRODYNAMIC IMPACT OF A PRISMATIC FLOAT HAVING FREEDOM IN TRIM. Robert W. Miller. June 1952. 31p. diagrs., 2 tabs. (NACA TN 2698)

PRELANDING CONDITIONS  
(4.1.2.3)

AN IMPULSE-MOMENTUM METHOD FOR CALCULATING LANDING-GEAR CONTACT CONDITIONS IN ECCENTRIC LANDINGS. Robert T. Yntema and Benjamin Milwitzky. January 1952. 60p. diagrs., 3 tabs. (NACA TN 2596)

NORMAL ACCELERATIONS AND OPERATING CONDITIONS ENCOUNTERED BY A HELICOPTER IN AIR-MAIL OPERATIONS. Almer D. Crim and Marlin E. Hazen. June 1952. 17p. diagrs., photos., 2 tabs. (NACA TN 2714)



## Vibration and Flutter

### (4.2)

**A SUGGESTED METHOD OF ANALYZING FOR TRANSONIC FLUTTER OF CONTROL SURFACES BASED ON AVAILABLE EXPERIMENTAL EVIDENCE.** Albert L. Erickson and Jack D. Stephenson. December 16, 1947. 59p. diagrs., photos., 2 tabs. (NACA RM A7F30) (Declassified from Confidential, 6/5/53)

**INITIAL FLIGHT TESTS OF THE NACA FR-2, A HIGH-VELOCITY ROCKET-PROPELLED VEHICLE FOR TRANSONIC FLUTTER RESEARCH.** J. G. Barmby and J. M. Teitelbaum. March 4, 1948. 21p. diagrs., photos. (NACA RM L7J20) (Declassified from Restricted, 6/11/53)

**SOME PRELIMINARY RESULTS IN THE DETERMINATION OF AERODYNAMIC DERIVATIVES OF CONTROL SURFACES IN THE TRANSONIC SPEED RANGE BY MEANS OF A FLUSH-TYPE ELECTRICAL PRESSURE CELL.** Albert L. Erickson and Robert C. Robinson. October 8, 1948. 40p. diagrs., photos., 3 tabs. (NACA RM A8H03) (Declassified from Confidential, 6/11/53)

**ANALYTICAL DETERMINATION OF COUPLED BENDING-TORSION VIBRATIONS OF CANTILEVER BEAMS BY MEANS OF STATION FUNCTIONS.** Alexander Mendelson and Selwyn Gendler. 1951. ii, 20p. diagrs., 10 tabs. (NACA Rept. 1005. Formerly TN 2185)

**EFFECT OF ASPECT RATIO ON THE AIR FORCES AND MOMENTS OF HARMONICALLY OSCILLATING THIN RECTANGULAR WINGS IN SUPERSONIC POTENTIAL FLOW.** Charles E. Watkins. 1951. 17p. diagrs. (NACA Rept. 1028. Formerly NACA TN 2064)

**STUDY OF VORTEX SHEDDING AS RELATED TO SELF-EXCITED TORSIONAL OSCILLATIONS OF AN AIRFOIL.** Raymond L. Chuan and Richard J. Magnus, California Institute of Technology. September 1951. 49p. diagrs. (NACA TN 2429)

**AIR FORCES AND MOMENTS ON TRIANGULAR AND RELATED WINGS WITH SUBSONIC LEADING EDGES OSCILLATING IN SUPERSONIC POTENTIAL FLOW.** Charles E. Watkins. September 1951. 44p. diagrs. (NACA TN 2457)

**NUMERICAL DETERMINATION OF INDICIAL LIFT OF TWO-DIMENSIONAL AIRFOILS AT SUBSONIC MACH NUMBERS FROM OSCILLATORY LIFT COEFFICIENTS WITH CALCULATIONS FOR MACH NUMBER 0.7.** Bernard Mazelsky. December 1951. 38p. diagrs., tab. (NACA TN 2562)

**DETERMINATION OF INDICIAL LIFT AND MOMENT OF A TWO-DIMENSIONAL PITCHING AIRFOIL AT SUBSONIC MACH NUMBERS FROM OSCILLATORY COEFFICIENTS WITH NUMERICAL CALCULATIONS FOR A MACH NUMBER OF 0.7.** Bernard Mazelsky. February 1952. 30p. diagrs., tab. (NACA TN 2613)

**TRANSVERSE VIBRATIONS OF HOLLOW THIN-WALLED CYLINDRICAL BEAMS.** Bernard Budiansky and Edwin T. Kruszewski. April 1952. 29p. diagrs. (NACA TN 2682)

**NUMERICAL DETERMINATION OF INDICIAL LIFT AND MOMENT FUNCTIONS FOR A TWO-DIMENSIONAL SINKING AND PITCHING AIRFOIL AT MACH NUMBERS 0.5 AND 0.6.** Bernard Mazelsky and Joseph A. Drischler. July 1952. 37p. diagrs., 4 tabs. (NACA TN 2739)

**ANALYTICAL STUDY OF SHIMMY OF AIRPLANE WHEELS.** (Étude Théorique du Shimmy des Roues d'Avion). Christian Bourcier de Carbon. September 1952. 126p. diagrs., photos. (NACA TM 1337. Trans. from Office National d'Etudes et de Recherches Aéronautiques, Pub. 7, 1948).

**CALCULATION AND MEASUREMENT OF NORMAL MODES OF VIBRATION OF AN ALUMINUM-ALLOY BOX BEAM WITH AND WITHOUT LARGE DISCONTINUITIES.** Frank C. Smith and Darnley M. Howard, National Bureau of Standards. January 1953. 40p. diagrs., photo., 8 tabs. (NACA TN 2884)

## WINGS AND AILERONS

### (4.2.1)

**INITIAL TEST IN THE TRANSONIC RANGE OF FOUR FLUTTER AIRFOILS ATTACHED TO A FREELY FALLING BODY.** J. G. Barmby and S. A. Clevenson. May 5, 1947. 16p. diagrs., photo., 2 tabs. (NACA RM L7B27) (Declassified from Restricted, 6/5/53)

**A SUGGESTED METHOD OF ANALYZING FOR TRANSONIC FLUTTER OF CONTROL SURFACES BASED ON AVAILABLE EXPERIMENTAL EVIDENCE.** Albert L. Erickson and Jack D. Stephenson. December 16, 1947. 59p. diagrs., photos., 2 tabs. (NACA RM A7F30) (Declassified from Confidential, 6/5/53)

**FLUTTER INVESTIGATION IN THE TRANSONIC RANGE OF SIX AIRFOILS ATTACHED TO THREE FREELY FALLING BODIES.** S. A. Clevenson and William T. Lauten, Jr. May 6, 1948. 32p. diagrs., photos., 2 tabs. (NACA RM L7K17) (Declassified from Restricted, 6/11/53)

**INITIAL FLIGHT TEST OF THE NACA FR-1-A, A LOW-ACCELERATION ROCKET-PROPELLED VEHICLE FOR TRANSONIC FLUTTER RESEARCH.** Ellwyn E. Angle. 25p. diagrs., photos. June 29, 1948. (NACA RM L7J08) (Declassified from Restricted, 6/11/53)

*Wings and Ailerons (Cont.)*

WIND-TUNNEL INVESTIGATION OF TRANSONIC AILERON FLUTTER OF A SEMISPAN WING MODEL WITH AN NACA 23013 SECTION. Angelo Perone and Albert L. Erickson. July 12, 1948. 23p. diags., photos., tab. (NACA RM A8D27) (Declassified from Confidential, 6/11/53)

FLIGHT TEST OF NACA FR-1-B, A LOW-ACCELERATION ROCKET-PROPELLED VEHICLE FOR TRANSONIC FLUTTER RESEARCH. Ellwyn E. Angle, Sherman A. Clevenson and Reginald R. Lundstrom. July 20, 1948. 22p. diags., photos., 3 tabs. (NACA RM L8C24) (Declassified from Restricted, 6/11/53)

SOME PRELIMINARY RESULTS IN THE DETERMINATION OF AERODYNAMIC DERIVATIVES OF CONTROL SURFACES IN THE TRANSONIC SPEED RANGE BY MEANS OF A FLUSH-TYPE ELECTRICAL PRESSURE CELL. Albert L. Erickson and Robert C. Robinson. October 8, 1948. 40p. diags., photos., 3 tabs. (NACA RM A8H03) (Declassified from Confidential, 6/11/53)

ON THE THEORY OF OSCILLATING AIRFOILS OF FINITE SPAN IN SUBSONIC COMPRESSIBLE FLOW. Eric Reissner, Massachusetts Institute of Technology. 1950. ii, 9p. (NACA Rept. 1002. Formerly TN 1953)

STUDY OF EFFECTS OF SWEEP ON THE FLUTTER OF CANTILEVER WINGS. J. G. Barmby, H. J. Cunningham and I. E. Garrick. 1951. ii, 25p. diags., photo., 7 tabs. (NACA Rept. 1014. Formerly TN 2121; RM L8H30)

SINGLE-DEGREE-OF-FREEDOM-FLUTTER CALCULATIONS FOR A WING IN SUBSONIC POTENTIAL FLOW AND COMPARISON WITH AN EXPERIMENT. Harry L. Runyan. July 1951. 27p. diags. (NACA TN 2396)

THE INDICIAL LIFT AND PITCHING MOMENT FOR A SINKING OR PITCHING TWO-DIMENSIONAL WING FLYING AT SUBSONIC OR SUPERSONIC SPEEDS. Harvard Lomax, Max. A. Heaslet and Loma Sluder. July 1951. 56p. diags., tab. (NACA TN 2403)

THREE PAPERS FROM CONFERENCE ON "WING AND TAIL-SURFACE OSCILLATIONS" - MARCH 6-8, 1941, MUNICH. I. REMARKS CONCERNING AERODYNAMICALLY BALANCED CONTROL SURFACES. (Bemerkung zum aerodynamisch innenausgeglichenen Ruder). H. Söhngen. II. AERODYNAMICALLY EQUIVALENT SYSTEMS FOR VARIOUS FORMS OF CONTROL SURFACES WITHIN THE SCOPE OF THE TWO-DIMENSIONAL WING THEORY. (Aerodynamische Ersatzsysteme für verschiedene Ruderformen im Rahmen der zweidimensionalen Tragflächentheorie). L. Schwarz. III. COMPARATIVE CALCULATIONS CONCERNING AERODYNAMIC BALANCE OF CONTROL SURFACES. (Vergleichsrechnungen zum aerodynamischen Ruderinnenausgleich). F. Dietze. August 1951. 47p. diags., tab. (NACA TM 1306. Trans. from Lilienthal Gesellschaft für Luftfahrtforschung, Berlin. Bericht 135, p.61-74)

ANALYSIS OF PURE-BENDING FLUTTER OF A CANTILEVER SWEEP WING AND ITS RELATION TO BENDING-TORSION FLUTTER. H. J. Cunningham. September 1951. 24p. diags. (NACA TN 2461)

LIFT AND MOMENT ON OSCILLATING TRIANGULAR AND RELATED WINGS WITH SUPERSONIC EDGES. Herbert C. Nelson. September 1951. 34p. diags. (NACA TN 2494)

THE AERODYNAMIC BEHAVIOR OF A HARMONICALLY OSCILLATING FINITE SWEEPBACK WING IN SUPERSONIC FLOW. Chieh-Chien Chang, Johns Hopkins University. October 1951. 76p. diags. (NACA TN 2467)

PRESENT STATE OF DEVELOPMENT IN NON-STEADY MOTION OF A LIFTING SURFACE. (Lo stato attuale delle ricerche sul moto instazionario di una superficie portante). P. Cicala. October 1951. 96p. diags., 3 tabs. (NACA TM 1277. Trans. from Aerotecnica, v.21, no.9-10, Sept.-Oct.1941, p.557-591, 670-685, 759-773).

EXPERIMENTAL AERODYNAMIC DERIVATIVES OF A SINUSOIDALLY OSCILLATING AIRFOIL IN TWO-DIMENSIONAL FLOW. Robert L. Halfman, Massachusetts Institute of Technology. November 1951. 83p. diags., photo., 19 tabs. (NACA TN 2465)

EVALUATION OF HIGH-ANGLE-OF-ATTACK AERODYNAMIC-DERIVATIVE DATA AND STALL-FLUTTER PREDICTION TECHNIQUES. Robert L. Halfman, H. C. Johnson and S. M. Haley, Massachusetts Institute of Technology. November 1951. 154p. diags., photos., 11 tabs. (NACA TN 2533)

APPLICATION OF RESPONSE FUNCTION TO CALCULATION OF FLUTTER CHARACTERISTICS OF A WING CARRYING CONCENTRATED MASSES. H. Serbin and E. L. Costilow, Purdue University. November 1951. 52p. diags., 3 tabs. (NACA TN 2540)

EFFECT OF VARIOUS PARAMETERS INCLUDING MACH NUMBER ON THE SINGLE-DEGREE-OF-FREEDOM FLUTTER OF A CONTROL SURFACE IN POTENTIAL FLOW. Harry L. Runyan. December 1951. 33p. diags. (NACA TN 2551)

CONSIDERATIONS ON THE EFFECT OF WIND-TUNNEL WALLS ON OSCILLATING AIR FORCES FOR TWO-DIMENSIONAL SUBSONIC COMPRESSIBLE FLOW. Harry L. Runyan and Charles E. Watkins. December 1951. 18p. diags. (NACA TN 2552)

SOME EFFECTS OF VARIATIONS IN SEVERAL PARAMETERS INCLUDING FLUID DENSITY ON THE FLUTTER SPEED OF LIGHT UNIFORM CANTILEVER WINGS. Donald S. Woolston and George E. Castile. December 1951. 40p. diags., 10 tabs. (NACA TN 2558)

CALCULATIONS ON THE FORCES AND MOMENTS FOR AN OSCILLATING WING-AILERON COMBINATION IN TWO-DIMENSIONAL POTENTIAL FLOW AT SONIC SPEED. Herbert C. Nelson and Julian H. Berman. January 1952. 36p. diags., 2 tabs. (NACA TN 2590)

INVESTIGATION OF THE STRUCTURAL DAMPING OF A FULL-SCALE AIRPLANE WING. Dwight O. Fearnow. February 1952. 11p. diags., photo., tab. (NACA TN 2594. Formerly RM L51A04)

SOME DYNAMIC EFFECTS OF FUEL MOTION IN SIMPLIFIED MODEL TIP TANKS ON SUDDENLY EXCITED BENDING OSCILLATIONS. Kenneth F. Merten and Bertrand H. Stephenson. September 1952. 35p. diags., photos., 2 tabs. (NACA TN 2789)

*Wings and Ailerons (Cont.)*

STEADY VIBRATIONS OF WING OF CIRCULAR PLAN FORM. (Ob ustanovivshikhsya kolebaniyakh kryla krugovoi formy v plane). THEORY OF WING OF CIRCULAR PLAN FORM. (Teoriya kryla konechnogo razmakha krugovoi formy v plane). N. E. Kochin. January 1953. 93p. diags. (NACA TM 1324. Trans. from: Prikladnaya Matematika i Mekhanika, v. 6, no. 4, 1942, p. 287-316; Prikladnaya Matematika i Mekhanika, v. 4, no. 1, 1940, p. 3-32).

**TAILS  
(4.2.2)**

THREE PAPERS FROM CONFERENCE ON "WING AND TAIL-SURFACE OSCILLATIONS" - MARCH 6-8, 1941, MUNICH. I. REMARKS CONCERNING AERODYNAMICALLY BALANCED CONTROL SURFACES. (Bemerkung zum aerodynamisch innenausgeglichene Ruder). H. Söhngen. II. AERODYNAMICALLY EQUIVALENT SYSTEMS FOR VARIOUS FORMS OF CONTROL SURFACES WITHIN THE SCOPE OF THE TWO-DIMENSIONAL WING THEORY. (Aerodynamische Ersatzsysteme für verschiedene Ruderformen im Rahmen der zweidimensionalen Tragflächentheorie). L. Schwarz. III. COMPARATIVE CALCULATIONS CONCERNING AERODYNAMIC BALANCE OF CONTROL SURFACES. (Vergleichsrechnungen zum aerodynamischen Ruderinnenausgleich). F. Dietze. August 1951. 47p. diags., tab. (NACA TM 1306. Trans. from Lillenthal Gesellschaft für Luftfahrtforschung, Berlin. Bericht 135, p.61-74)

SINGLE-DEGREE-OF-FREEDOM-FLUTTER CALCULATIONS FOR A WING IN SUBSONIC POTENTIAL FLOW AND COMPARISON WITH AN EXPERIMENT. Harry L. Runyan. 1952. ii, 8p. diags. (NACA Rept. 1089. Formerly TN 2396)

**ELEVATORS AND RUDDERS  
(4.2.2.1)**

EFFECT OF VARIOUS PARAMETERS INCLUDING MACH NUMBER ON THE SINGLE-DEGREE-OF-FREEDOM FLUTTER OF A CONTROL SURFACE IN POTENTIAL FLOW. Harry L. Runyan. December 1951. 33p. diags. (NACA TN 2551)

**TABS  
(4.2.2.2)**

EFFECT OF VARIOUS PARAMETERS INCLUDING MACH NUMBER ON THE SINGLE-DEGREE-OF-FREEDOM FLUTTER OF A CONTROL SURFACE IN POTENTIAL FLOW. Harry L. Runyan. December 1951. 33p. diags. (NACA TN 2551)

**PROPELLER, FANS, AND  
COMPRESSORS  
(4.2.4)**

NACA RM 8107  
National Advisory Committee for Aeronautics.  
RESPONSE OF A ROTATING PROPELLER TO AERODYNAMIC EXCITATION. Walter E. Arnoldi, Hamilton Standard Propellers Division, United Aircraft Corporation. January 21, 1949. 26p. diags. (NACA RM 8107) (Declassified from Restricted, 9/16/52)

A METHOD FOR PREDICTING THE UPWASH ANGLES INDUCED AT THE PROPELLER PLANE OF A COMBINATION OF BODIES WITH AN UNSWEPT WING. Paul F. Yaggy. October 1951. 24p. diags., photos. (NACA TN 2528)

EFFECTS OF WING SWEEP ON THE UPWASH AT THE PROPELLER PLANES OF MULTIENGINE AIRPLANES. Vernon L. Rogallo. September 1952. 46p. diags. (NACA TN 2795)

CALCULATIONS OF UPWASH IN THE REGION ABOVE OR BELOW THE WING-CHORD PLANES OF SWEEP-BACK WING-FUSELAGE-NACELLE COMBINATIONS. Vernon L. Rogallo and John L. McCloud, III. February 1953. 15p. diags., photo. (NACA TN 2894)

**ROTATING-WING AIRCRAFT  
(4.2.5)**

AN INVESTIGATION OF BENDING-MOMENT DISTRIBUTION ON A MODEL HELICOPTER ROTOR BLADE AND A COMPARISON WITH THEORY. John R. Meyer, Jr., Massachusetts Institute of Technology. February 1952. 91p. diags., photos 12 tabs. (NACA TN 2626)

## Structures

## (4.3)

A LINEAR TIME-TEMPERATURE RELATION FOR EXTRAPOLATION OF CREEP AND STRESS-RUPTURE DATA. S. S. Manson and A. M. Haferd. March 1953. 49p. diagrs. (NACA TN 2890)

## COLUMNS

## (4.3.1)

EFFECTIVE MODULUS IN PLASTIC BUCKLING OF HIGH-STRENGTH ALUMINUM-ALLOY SHEET. James A. Miller and Pearl V. Jacobs, National Bureau of Standards. September 1951. 15p. diagrs., 2 tabs. (NACA RM 51G11)

INELASTIC COLUMN BEHAVIOR. John E. Duberg and Thomas W. Wilder, III. 1952. iii, 16p. (NACA Rept. 1072. Formerly TN 2267)

INTERACTION OF COLUMN AND LOCAL BUCKLING IN COMPRESSION MEMBERS. P. P. Bijlaard and G. P. Fisher, Cornell University. March 1952. 110p. diagrs., photos., 4 tabs. (NACA TN 2640)

THE EFFECT OF INITIAL CURVATURE ON THE STRENGTH OF AN INELASTIC COLUMN. Thomas W. Wilder, III, William A. Brooks, Jr., and Eldon E. Mathauser. January 1953. 17p. diagrs. (NACA TN 2872)

TUBULAR  
(4.3.1.1)

TORSION, COMPRESSION, AND BENDING TESTS OF TUBULAR SECTIONS MACHINED FROM 75S-T6 ROLLED ROUND ROD. R. L. Moore and J. W. Clark, Aluminum Company of America. November 1952. 33p. diagrs., photos., 4 tabs. (NACA RM 52I25)

BEAMS  
(4.3.1.2)

INTRODUCTION TO ELECTRICAL-CIRCUIT ANALOGIES FOR BEAM ANALYSIS. Stanley U. Benscoter and Richard H. MacNeal, California Institute of Technology. September 1952. 48p. diagrs., 5 tabs. (NACA TN 2785)

BUCKLING OF LOW ARCHES OR CURVED BEAMS OF SMALL CURVATURE. Y. C. Fung and A. Kaplan, California Institute of Technology. November 1952. 75p. diagrs., photo., 9 tabs. (NACA TN 2840)

## FRAMES, GRIDWORKS, AND TRUSSES

## (4.3.2)

METHOD FOR ANALYZING INDETERMINATE STRUCTURES STRESSED ABOVE PROPORTIONAL LIMIT. F. R. Steinbacher, C. N. Gaylord and W. K. Rey, University of Alabama. June 1951. 47p. diagrs., photos., 3 tabs. (NACA TN 2376)

THE STRUCTURE OF AIRY'S STRESS FUNCTION IN MULTIPLY CONNECTED REGIONS. (Struttura della funzione di Airy nei sistemi moltiplicemente connessi). Giuseppe Grioli. July 1951. 34p. (NACA TM 1290. Trans. from Giornale di Matematiche, v.77, 1947, p.119-144).

AN ANALYSIS OF STATICALLY INDETERMINATE TRUSSES HAVING MEMBERS STRESSED BEYOND THE PROPORTIONAL LIMIT. Thomas W. Wilder, III. February 1953. 13p. diagrs., 4 tabs. (NACA TN 2886)

## PLATES

## (4.3.3)

THE STRUCTURE OF AIRY'S STRESS FUNCTION IN MULTIPLY CONNECTED REGIONS. (Struttura della funzione di Airy nei sistemi moltiplicemente connessi). Giuseppe Grioli. July 1951. 34p. (NACA TM 1290. Trans. from Giornale di Matematiche, v.77, 1947, p.119-144).

DEFLECTION AND STRESS ANALYSIS OF THIN SOLID WINGS OF ARBITRARY PLAN FORM WITH PARTICULAR REFERENCE TO DELTA WINGS. Manuel Stein, J. Edward Anderson and John M. Hedgepeth. February 1952. 53p. photo., diagrs. (NACA TN 2621)

DEFLECTION OF DELTA WINGS HAVING A CARRY-THROUGH-BAY CHORD SMALLER THAN THE WING ROOT CHORD. Roger W. Peters and Manuel Stein. May 1953. 25p. diagrs., photo., 2 tabs. (NACA TN 2927)

FLAT  
(4.3.3.1)

A PHOTOELASTIC INVESTIGATION OF STRESS CONCENTRATIONS DUE TO SMALL FILLETS AND GROOVES IN TENSION. M. M. Frocht, Illinois Institute of Technology. August 1951. 45p. diagrs., photos., 5 tabs. (NACA TN 2442)

LOADS AND CONSTRUCTION  
148 STRUCTURES (4.3)

*Flat-Plates (Cont.)*

A STUDY OF ELASTIC AND PLASTIC STRESS CONCENTRATION FACTORS DUE TO NOTCHES AND FILLETS IN FLAT PLATES. Herbert F. Hardrath and Lachlan Ohman. December 1951. 23p. diagrs. (NACA TN 2566)

DEFLECTIONS OF A SIMPLY SUPPORTED RECTANGULAR SANDWICH PLATE SUBJECTED TO TRANSVERSE LOADS. Kuo Tai Yen, Sadettin Gunturkun and Frederick V. Pohle, Polytechnic Institute of Brooklyn. December 1951. 39p. curves, diagrs., 3 tabs. (NACA TN 2581)

BUCKLING OF RECTANGULAR SANDWICH PLATES SUBJECTED TO EDGEWISE COMPRESSION WITH LOADED EDGES SIMPLY SUPPORTED AND UNLOADED EDGES CLAMPED. Kuo Tai Yen, V. L. Salerno and N. J. Hoff. Polytechnic Institute of Brooklyn. January 1952. 66p. diagrs., tab. (NACA TN 2556)

STRESS PROBLEMS IN PRESSURIZED CABINS. W. Flügge, Stanford University. February 1952. 91p. diagrs. (NACA TN 2612)

Unstiffened  
(4.3.3.1.1)

COMPRESSIVE STRENGTH OF FLANGES. Elbridge Z. Stowell. 1951. 14p. diagrs., tab. (NACA Rept. 1029. Formerly TN 2020)

CHARTS GIVING CRITICAL COMPRESSIVE STRESS OF CONTINUOUS FLAT SHEET DIVIDED INTO PARALLELOGRAM-SHAPED PANELS. Roger A. Anderson. July 1951. 31p. diagrs., 3 tabs. (NACA TN 2392)

EFFECTIVE MODULUS IN PLASTIC BUCKLING OF HIGH-STRENGTH ALUMINUM-ALLOY SHEET. James A. Miller and Pearl V. Jacobs, National Bureau of Standards. September 1951. 15p. diagrs., 2 tabs. (NACA RM 51G11)

CRITICAL COMBINATIONS OF BENDING, SHEAR, AND TRANSVERSE COMPRESSIVE STRESSES FOR BUCKLING OF INFINITELY LONG FLAT PLATES. Aldie E. Johnson, Jr. and Kenneth P. Buchert. December 1951. 40p. diagrs., 3 tabs. (NACA TN 2536)

COMPRESSIVE BUCKLING OF FLAT RECTANGULAR METALITE TYPE SANDWICH PLATES WITH SIMPLY SUPPORTED LOADED EDGES AND CLAMPED UNLOADED EDGES. (Revised) Paul Seide. February 1952. 27p. diagrs., 3 tabs. (NACA TN 2637) (Superseded TN 1886, May 1949)

THE STABILITY UNDER LONGITUDINAL COMPRESSION OF FLAT SYMMETRIC CORRUGATED-CORE SANDWICH PLATES WITH SIMPLY SUPPORTED LOADED EDGES AND SIMPLY SUPPORTED OR CLAMPED UNLOADED EDGES. Paul Seide. April 1952. 27p. diagrs. (NACA TN 2679)

EXPERIMENTAL AND THEORETICAL DETERMINATION OF THERMAL STRESSES IN A FLAT PLATE. Richard R. Heldenfels and William M. Roberts. August 1952. 35p. diagrs., photo. (NACA TN 2769)

THERMAL BUCKLING OF PLATES. Myron L. Gossard, Paul Seide, and William M. Roberts. August 1952. 39p. diagrs. (NACA TN 2771)

Stiffened  
(4.3.3.1.2)

THE STABILITY OF THE COMPRESSION COVER OF BOX BEAMS STIFFENED BY POSTS. Paul Seide and Paul F. Barrett. 1951. ii, 16p. diagrs., 3 tabs. (NACA Rept. 1047. Formerly TN 2153)

RELATIVE STRUCTURAL EFFICIENCIES OF FLAT Balsa-CORE SANDWICH AND STIFFENED-PANEL CONSTRUCTION. Ralph E. Hubka, Norris F. Dow and Paul Seide. October 1951. 29p. diagrs. (NACA TN 2514)

DIRECT-READING DESIGN CHARTS FOR 75S-T6 ALUMINUM-ALLOY FLAT COMPRESSION PANELS HAVING LONGITUDINAL EXTRUDED Z-SECTION STIFFENERS. William A. Hickman and Norris F. Dow. February 1952. 60p. diagrs., photos., 8 tabs. (NACA TN 2435)

INVESTIGATION OF STRESS DISTRIBUTION IN RECTANGULAR PLATES WITH LONGITUDINAL STIFFENERS UNDER AXIAL COMPRESSION AFTER BUCKLING. Chi-Teh Wang and Harry Zuckerberg, New York University. March 1952. 61p. diagrs. (NACA TN 2671)

DERIVATION OF STABILITY CRITERIONS FOR BOX BEAMS WITH LONGITUDINALLY STIFFENED COVERS CONNECTED BY POSTS. Paul Seide. August 1952. 21p. diagr. (NACA TN 2760)

PRELIMINARY RESULTS OF STABILITY CALCULATIONS FOR THE BENDING OF BOX BEAMS WITH LONGITUDINALLY STIFFENED COVERS CONNECTED BY POSTS. Roger A. Anderson, Thomas W. Wilder, III and Aldie E. Johnson, Jr. December 1952. 17p. diagrs., tab. (NACA RM L52K10a)

THE EFFECT OF LONGITUDINAL STIFFENERS LOCATED ON ONE SIDE OF A PLATE ON THE COMPRESSIVE BUCKLING STRESS OF THE PLATE-STIFFENER COMBINATION. Paul Seide. January 1953. 66p. diagrs., 2 tabs. (NACA TN 2873)

DIRECT-READING DESIGN CHARTS FOR 24S-T3 ALUMINUM-ALLOY FLAT COMPRESSION PANELS HAVING LONGITUDINAL FORMED HAT-SECTION STIFFENERS AND COMPARISONS WITH PANELS HAVING Z-SECTION STIFFENERS. William A. Hickman and Norris F. Dow. March 1953. 71p. photos., diagrs., 8 tabs. (NACA TN 2792)

CURVED  
(4.3.3.2)

BEHAVIOR IN PURE BENDING OF A LONG MONOCOQUE BEAM OF CIRCULAR-ARC CROSS SECTION. Robert W. Fralich, J. Mayers and Eric Reissner. January 1953. 33p. diagrs. (NACA TN 2875)

Unstiffened  
(4.3.3.2.1)

A SMALL-DEFLECTION THEORY FOR CURVED SANDWICH PLATES. Manuel Stein and J. Mayers. 1951. 6p. diagr. (NACA Rept. 1008. Formerly NACA TN 2017)

PRINCIPLE AND APPLICATION OF COMPLEMENTARY ENERGY METHOD FOR THIN HOMOGENEOUS AND SANDWICH PLATES AND SHELLS WITH FINITE DEFLECTIONS. Chi-Teh Wang, New York University. February 1952. 33p. diagrs. (NACA TN 2620)

THERMAL BUCKLING OF PLATES. Myron L. Gossard, Paul Seide, and William M. Roberts. August 1952. 39p. diagrs. (NACA TN 2771)

BENDING OF THIN PLATES WITH COMPOUND CURVATURE. H. G. Lew, Pennsylvania State College. October 1952. 49p. diagrs., 2 tabs. (NACA TN 2782)

BUCKLING OF LOW ARCHES OR CURVED BEAMS OF SMALL CURVATURE. Y. C. Fung and A. Kaplan, California Institute of Technology. November 1952. 75p. diagrs., photo., 9 tabs. (NACA TN 2840)

Stiffened  
(4.3.3.2.2)

COMPRESSIVE BUCKLING OF SIMPLY SUPPORTED CURVED PLATES AND CYLINDERS OF SANDWICH CONSTRUCTION. Manuel Stein and J. Mayers. January 1952. 34p. diagrs. (NACA TN 2601)

A SUMMARY OF DIAGONAL TENSION. PART I - METHODS OF ANALYSIS. Paul Kuhn, James P. Peterson and L. Ross Levin. May 1952. v, 131p. diagrs., photo. (NACA TN 2661)

A SUMMARY OF DIAGONAL TENSION. PART II - EXPERIMENTAL EVIDENCE. Paul Kuhn, James P. Peterson and L. Ross Levin. May 1952. ii, 81p. diagrs., photos., 8 tabs. (NACA TN 2662)

**BEAMS**  
(4.3.4)

DEFLECTION AND STRESS ANALYSIS OF THIN SOLID WINGS OF ARBITRARY PLAN FORM WITH PARTICULAR REFERENCE TO DELTA WINGS. Manuel Stein, J. Edward Anderson and John M. Hedgepeth. February 1952. 53p. photo., diagrs. (NACA TN 2621)

TRANSVERSE VIBRATIONS OF HOLLOW THIN-WALLED CYLINDRICAL BEAMS. Bernard Budiansky and Edwin T. Kruszewski. April 1952. 29p. diagrs. (NACA TN 2682)

ON TRAVELING WAVES IN BEAMS. Robert W. Leonard and Bernard Budiansky. January 1953. 76p. diagrs., tab. (NACA TN 2874)

BEHAVIOR IN PURE BENDING OF A LONG MONOCOQUE BEAM OF CIRCULAR-ARC CROSS SECTION. Robert W. Fralich, J. Mayers and Eric Reissner. January 1953. 33p. diagrs. (NACA TN 2875)

DEFLECTION OF DELTA WINGS HAVING A CARRY-THROUGH-BAY CHORD SMALLER THAN THE WING ROOT CHORD. Roger W. Peters and Manuel Stein. May 1953. 25p. diagrs., photo., 2 tabs. (NACA TN 2927)

**BOX**  
(4.3.4.1)

THE STABILITY OF THE COMPRESSION COVER OF BOX BEAMS STIFFENED BY POSTS. Paul Seide and Paul F. Barrett. 1951. ii, 16p. diagrs., 3 tabs. (NACA Rept. 1047. Formerly TN 2153)

AN EXPERIMENTAL DETERMINATION OF THE CRITICAL BENDING MOMENT OF A BOX BEAM STIFFENED BY POSTS. Paul F. Barrett and Paul Seide. July 1951. 9p. diagrs., photos. (NACA TN 2414)

RELATIVE STRUCTURAL EFFICIENCIES OF FLAT Balsa-CORE SANDWICH AND STIFFENED-PANEL CONSTRUCTION. Ralph E. Hubka, Norris F. Dow and Paul Seide. October 1951. 29p. diagrs. (NACA TN 2514)

FLEXURAL FATIGUE STRENGTHS OF RIVETED BOX BEAMS - ALCLAD 14S-T6, ALCLAD 75S-T6, AND VARIOUS TEMPER OF ALCLAD 24S. I. D. Eaton and Marshall Holt. Aluminum Company of America. November 1951. 25p. diagrs., photos., 3 tabs. (NACA TN 2452)

TORSION AND BENDING OF PRISMATIC RODS OF HOLLOW RECTANGULAR SECTION. (Kruchenie i Izgib Prismaticeskikh Sterzhnei s Polym Pryamougol'nym Secheniem). B. L. Ahramyan. November 1951. 24p. diagrs., 2 tabs. (NACA TM 1319. Trans. from Prikladnaya Matematika i Mekhanika, v.14, no.3, 1950, p.265-276).

STRESSES AND DEFORMATIONS IN WINGS SUBJECTED TO TORSION. B. F. Ruffner and Eloise Hout, Oregon State College. February 1952. 79p. diagrs., 23 tabs. (NACA TN 2600)

DERIVATION OF STABILITY CRITERIONS FOR BOX BEAMS WITH LONGITUDINALLY STIFFENED COVERS CONNECTED BY POSTS. Paul Seide. August 1952. 21p. diagr. (NACA TN 2760)

PRELIMINARY RESULTS OF STABILITY CALCULATIONS FOR THE BENDING OF BOX BEAMS WITH LONGITUDINALLY STIFFENED COVERS CONNECTED BY POSTS. Roger A. Anderson, Thomas W. Wilder, III and Aldie E. Johnson, Jr. December 1952. 17p. diagrs., tab. (NACA RM L52K10a)

CALCULATION AND MEASUREMENT OF NORMAL MODES OF VIBRATION OF AN ALUMINUM-ALLOY BOX BEAM WITH AND WITHOUT LARGE DISCONTINUITIES. Frank C. Smith and Darnley M. Howard, National Bureau of Standards. January 1953. 40p. diagrs., photo., 8 tabs. (NACA TN 2884)

## LOADS AND CONSTRUCTION 150 STRUCTURES (4.3)

### DIAGONAL TENSION (4.3.4.2)

EQUAL-STRENGTH DESIGN OF TENSION-FIELD WEBS AND UPRIGHTS. Ralph H. Upson, George M. Phelps and Tung-Sheng Liu, University of Minnesota. January 1952. 46p. diags., photos., 4 tabs. (NACA TN 2548)

A SUMMARY OF DIAGONAL TENSION. PART I - METHODS OF ANALYSIS. Paul Kuhn, James P. Peterson and L. Ross Levin. May 1952. v, 131p. diags., photo. (NACA TN 2661)

A SUMMARY OF DIAGONAL TENSION. PART II - EXPERIMENTAL EVIDENCE. Paul Kuhn, James P. Peterson and L. Ross Levin. May 1952. ii, 81p. diags., photos., 8 tabs. (NACA TN 2662)

STRENGTH ANALYSIS OF STIFFENED THICK BEAM WEBS WITH RATIOS OF WEB DEPTH TO WEB THICKNESS OF APPROXIMATELY 60. L. Ross Levin. May 1953. 11p. photo., diags., 2 tabs. (NACA TN 2930)

### SHELLS (4.3.5)

A NUMERICAL METHOD FOR THE STRESS ANALYSIS OF STIFFENED-SHELL STRUCTURES UNDER NONUNIFORM TEMPERATURE DISTRIBUTIONS. Richard R. Heldenfels. 1951. ii, 20p. diags., 9 tabs. (NACA Rept. 1043. Formerly TN 2241)

SECONDARY STRESSES IN THIN-WALLED BEAMS WITH CLOSED CROSS SECTIONS. Stanley Urner Benscoter, California Institute of Technology. October 1951. 104p. diags. (NACA TN 2529)

PRINCIPLE AND APPLICATION OF COMPLEMENTARY ENERGY METHOD FOR THIN HOMOGENEOUS AND SANDWICH PLATES AND SHELLS WITH FINITE DEFLECTIONS. Chi-Teh Wang, New York University. February 1952. 33p. diags. (NACA TN 2620)

BEHAVIOR IN PURE BENDING OF A LONG MONOCOQUE BEAM OF CIRCULAR-ARC CROSS SECTION. Robert W. Fralich, J. Mayers and Eric Reissner. January 1953. 33p. diags. (NACA TN 2875)

### CYLINDERS (4.3.5.1)

STABILITY OF THE CYLINDRICAL SHELL OF VARIABLE CURVATURE. (Stabilität der Zylinderschale veränderlicher Krümmung). K. Marguerre. July 1951. 64p. diags. (NACA TM 1302. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1671, September 16, 1942).

A BIHARMONIC RELAXATION METHOD FOR CALCULATING THERMAL STRESS IN COOLED IRREGULAR CYLINDERS. Arthur G. Holms. 1952. ii, 19p. diags., 4 tabs. (NACA Rept. 1059. Formerly TN 2434)

TRANSVERSE VIBRATIONS OF HOLLOW THIN-WALLED CYLINDRICAL BEAMS. Bernard Budiansky and Edwin T. Kruszewski. April 1952. 29p. diags. (NACA TN 2682)

### Circular (4.3.5.1.1)

A SMALL-DEFLECTION THEORY FOR CURVED SANDWICH PLATES. Manuel Stein and J. Mayers. 1951. 6p. diagr. (NACA Rept. 1008. Formerly NACA TN 2017)

BUCKLING OF THIN-WALLED CYLINDER UNDER AXIAL COMPRESSION AND INTERNAL PRESSURE. Hsu Lo, Harold Crate and Edward B. Schwartz. 1951. 9p. diags. (NACA Rept. 1027. Formerly TN 2021)

COMPRESSIVE BUCKLING OF SIMPLY SUPPORTED CURVED PLATES AND CYLINDERS OF SANDWICH CONSTRUCTION. Manuel Stein and J. Mayers. January 1952. 34p. diags. (NACA TN 2601)

STRESS PROBLEMS IN PRESSURIZED CABINS. W. Flügge, Stanford University. February 1952. 91p. diags. (NACA TN 2612)

TORSION TESTS OF ALUMINUM-ALLOY STIFFENED CIRCULAR CYLINDERS. J. W. Clark and R. L. Moore, Aluminum Company of America. November 1952. 38p. diags., photos., 2 tabs. (NACA TN 2821)

TORSION, COMPRESSION, AND BENDING TESTS OF TUBULAR SECTIONS MACHINED FROM 75S-T6 ROLLED ROUND ROD. R. L. Moore and J. W. Clark, Aluminum Company of America. November 1952. 33p. diags., photos., 4 tabs. (NACA RM 52125)

### Elliptical (4.3.5.1.2)

STRESSES IN A TWO-BAY NONCIRCULAR CYLINDER UNDER TRANSVERSE LOADS. George E. Griffith. October 1951. 34p. diags., 3 tabs. (NACA TN 2512)

STRESS PROBLEMS IN PRESSURIZED CABINS. W. Flügge, Stanford University. February 1952. 91p. diags. (NACA TN 2612)

### BOXES (4.3.5.2)

TORSION AND BENDING OF PRISMATIC RODS OF HOLLOW RECTANGULAR SECTION. (Kruchenie i Izgib Prismaticeskikh Sterzhnei s Polym Pryamougol'nym Secheniem). B. L. Abramyan. November 1951. 24p. diags., 2 tabs. (NACA TM 1319. Trans. from Prikladnaya Matematika i Mekhanika, v.14, no.3, 1950, p.265-276).

EQUIVALENT PLATE THEORY FOR A STRAIGHT MULTICELL WING. Stanley U. Benscoter and Richard H. MacNeal, California Institute of Technology. September 1952. 32p. diags. (NACA TN 2786)

## CONNECTIONS

### (4.3.6)

#### RIVETED (4.3.6.2)

##### INVESTIGATION OF THE FATIGUE STRENGTH OF FULL-SCALE AIRPLANE WING STRUCTURES.

Dwight O. Fearnow. July 1951. 30p. diagrs., photos., 3 tabs. (NACA RM L51D13a)

FATIGUE AND STATIC TESTS OF FLUSH-RIVETED JOINTS. Darnley M. Howard and Frank C. Smith, National Bureau of Standards. June 1952. 38p. photos., diagrs., 3 tabs. (NACA TN 2709)

INTERIM REPORT ON A FATIGUE INVESTIGATION OF A FULL-SCALE TRANSPORT AIRCRAFT WING STRUCTURE. M. James McGuigan, Jr. April 1953. 36p. photos., diagrs., 2 tabs. (NACA TN 2920)

#### WELDED (4.3.6.3)

MECHANICAL AND CORROSION TESTS OF SPOT-WELDED ALUMINUM ALLOYS. Fred M. Reinhart, National Bureau of Standards, and W. F. Hess, R. A. Wyant, F. J. Winsor and R. R. Nash, Rensselaer Polytechnic Institute. December 1951. 74p. diagrs., photos., 19 tabs. (NACA TN 2538)

#### BONDED (4.3.6.4)

EFFECT OF TEMPERATURES FROM  $-70^{\circ}$  TO  $600^{\circ}$ F ON STRENGTH OF ADHESIVE-BONDED LAP SHEAR SPECIMENS OF CLAD 24S-T3 ALUMINUM ALLOY AND OF COTTON- AND GLASS-FABRIC PLASTIC LAMINATES. H. W. Eickner, W. Z. Olson and R. F. Blomquist, Forest Products Laboratory. June 1952. 26p. diagrs., 6 tabs. (NACA TN 2717)

## LOADS AND STRESSES (4.3.7)

A NUMERICAL METHOD FOR THE STRESS ANALYSIS OF STIFFENED-SHELL STRUCTURES UNDER NONUNIFORM TEMPERATURE DISTRIBUTIONS. Richard R. Heldenfels. 1951. ii, 20p. diagrs., 9 tabs. (NACA Rept. 1043. Formerly TN 2241)

A BIHARMONIC RELAXATION METHOD FOR CALCULATING THERMAL STRESS IN COOLED IRREGULAR CYLINDERS. Arthur G. Holms. 1952. ii, 19p. diagrs., 4 tabs. (NACA Rept. 1059. Formerly TN 2434)

INVESTIGATION OF STRESSES DUE TO THERMAL GRADIENTS IN TYPICAL AIRCRAFT STRUCTURES. Martin E. Barzelay and James C. Boison, Syracuse University. January 1952. 90p. diagrs., photos., tab. (NACA RM 51K06)

##### CHARTS AND APPROXIMATE FORMULAS FOR THE ESTIMATION OF AEROELASTIC EFFECTS ON THE LOADING OF SWEEPED AND UNSWEEPED WINGS.

Franklin W. Diederich and Kenneth A. Foss. February 1952. 98p. diagrs., 3 tabs. (NACA TN 2608)

EXPERIMENTAL AND THEORETICAL DETERMINATION OF THERMAL STRESSES IN A FLAT PLATE. Richard R. Heldenfels and William M. Roberts. August 1952. 35p. diagrs., photo. (NACA TN 2769)

THERMAL BUCKLING OF PLATES. Myron L. Gossard, Paul Seide, and William M. Roberts. August 1952. 39p. diagrs. (NACA TN 2771)

A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE INFLUENCE OF TEMPERATURE GRADIENTS ON THE DEFORMATION AND BURST SPEEDS OF ROTATING DISKS. P. I. Wilterdink, A. G. Holms and S. S. Manson. October 1952. 45p. diagrs., photo., 2 tabs. (NACA TN 2803)

CALIBRATION OF STRAIN-GAGE INSTALLATIONS IN AIRCRAFT STRUCTURES FOR THE MEASUREMENT OF FLIGHT LOADS. T. H. Skopinski, William S. Aiken, Jr. and Wilber B. Huston. October 8, 1952. 71p. diagrs., 10 tabs. (NACA RM L52G31) (Declassified from Confidential, 6/29/53)

#### TENSION (4.3.7.1)

THE STABILITY OF THE COMPRESSION COVER OF BOX BEAMS STIFFENED BY POSTS. Paul Seide and Paul F. Barrett. 1951. ii, 16p. diagrs., 3 tabs. (NACA Rept. 1047. Formerly TN 2153)

METHOD FOR ANALYZING INDETERMINATE STRUCTURES STRESSED ABOVE PROPORTIONAL LIMIT. F. R. Steinbacher, C. N. Gaylord and W. K. Rey, University of Alabama. June 1951. 47p. diagrs., photos., 3 tabs. (NACA TN 2376)

PLASTIC STRESS-STRAIN RELATIONS FOR 75S-T6 ALUMINUM ALLOY SUBJECTED TO BI-AXIAL TENSILE STRESSES. Joseph Marin, B. H. Ulrich and W. P. Hughes, Pennsylvania State College. August 1951. 48p. diagrs., photos., 5 tabs. (NACA TN 2425)

A STUDY OF ELASTIC AND PLASTIC STRESS CONCENTRATION FACTORS DUE TO NOTCHES AND FILLETS IN FLAT PLATES. Herbert F. Hardrath and Lachlan Ohman. December 1951. 23p. diagrs. (NACA TN 2566)

DERIVATION OF STABILITY CRITERIONS FOR BOX BEAMS WITH LONGITUDINALLY STIFFENED COVERS CONNECTED BY POSTS. Paul Seide. August 1952. 21p. diagr. (NACA TN 2760)

AN ANALYSIS OF STATICALLY INDETERMINATE TRUSSES HAVING MEMBERS STRESSED BEYOND THE PROPORTIONAL LIMIT. Thomas W. Wilder, III. February 1953. 13p. diagrs., 4 tabs. (NACA TN 2886)



COMPRESSION  
(4.3.7.2)

BUCKLING OF THIN-WALLED CYLINDER UNDER AXIAL COMPRESSION AND INTERNAL PRESSURE. Hsu Lo, Harold Crate and Edward B. Schwartz. 1951. 9p. diagrs. (NACA Rept. 1027. Formerly TN 2021)

COMPRESSIVE STRENGTH OF FLANGES. Elbridge Z. Stowell. 1951. 14p. diagrs., tab. (NACA Rept. 1029. Formerly TN 2020)

THE STABILITY OF THE COMPRESSION COVER OF BOX BEAMS STIFFENED BY POSTS. Paul Seide and Paul F. Barrett. 1951. ii, 16p. diagrs., 3 tabs. (NACA Rept. 1047. Formerly TN 2153)

METHOD FOR ANALYZING INDETERMINATE STRUCTURES STRESSED ABOVE PROPORTIONAL LIMIT. F. R. Steinbacher, C. N. Gaylord and W. K. Rey, University of Alabama. June 1951. 47p. diagrs., photos., 3 tabs. (NACA TN 2376)

CHARTS GIVING CRITICAL COMPRESSIVE STRESS OF CONTINUOUS FLAT SHEET DIVIDED INTO PARALLELOGRAM-SHAPED PANELS. Roger A. Anderson. July 1951. 31p. diagrs., 3 tabs. (NACA TN 2392)

STABILITY OF THE CYLINDRICAL SHELL OF VARIABLE CURVATURE. (Stabilität der Zylinderschale veränderlicher Krümmung). K. Marguerre. July 1951. 64p. diagrs. (NACA TM 1302. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1671, September 16, 1942).

CRITICAL COMBINATIONS OF BENDING, SHEAR, AND TRANSVERSE COMPRESSIVE STRESSES FOR BUCKLING OF INFINITELY LONG FLAT PLATES. Aldie E. Johnson, Jr. and Kenneth P. Buchert. December 1951. 40p. diagrs., 3 tabs. (NACA TN 2536)

BUCKLING OF RECTANGULAR SANDWICH PLATES SUBJECTED TO EDGEWISE COMPRESSION WITH LOADED EDGES SIMPLY SUPPORTED AND UNLOADED EDGES CLAMPED. Kuo Tai Yen, V. L. Salerno and N. J. Hoff. Polytechnic Institute of Brooklyn. January 1952. 66p. diagrs., tab. (NACA TN 2556)

COMPRESSIVE BUCKLING OF SIMPLY SUPPORTED CURVED PLATES AND CYLINDERS OF SANDWICH CONSTRUCTION. Manuel Stein and J. Mayers. January 1952. 34p. diagrs. (NACA TN 2601)

DIRECT-READING DESIGN CHARTS FOR 75S-T6 ALUMINUM-ALLOY FLAT COMPRESSION PANELS HAVING LONGITUDINAL EXTRUDED Z-SECTION STIFFENERS. William A. Hickman and Norris F. Dow. February 1952. 60p. diagrs., photos., 8 tabs. (NACA TN 2435)

COMPRESSIVE BUCKLING OF FLAT RECTANGULAR METALITE TYPE SANDWICH PLATES WITH SIMPLY SUPPORTED LOADED EDGES AND CLAMPED UNLOADED EDGES. (Revised) Paul Seide. February 1952. 27p. diagrs., 3 tabs. (NACA TN 2637) (Superseded TN 1886, May 1949)

INTERACTION OF COLUMN AND LOCAL BUCKLING IN COMPRESSION MEMBERS. P. P. Bijlaard and G. P. Fisher, Cornell University. March 1952. 110p. diagrs., photos., 4 tabs. (NACA TN 2640)

INVESTIGATION OF STRESS DISTRIBUTION IN RECTANGULAR PLATES WITH LONGITUDINAL STIFFENERS UNDER AXIAL COMPRESSION AFTER BUCKLING. Chi-Teh Wang and Harry Zuckerberg, New York University. March 1952. 61p. diagrs. (NACA TN 2671)

THE STABILITY UNDER LONGITUDINAL COMPRESSION OF FLAT SYMMETRIC CORRUGATED-CORE SANDWICH PLATES WITH SIMPLY SUPPORTED LOADED EDGES AND SIMPLY SUPPORTED OR CLAMPED UNLOADED EDGES. Paul Seide. April 1952. 27p. diagrs. (NACA TN 2679)

DERIVATION OF STABILITY CRITERIONS FOR BOX BEAMS WITH LONGITUDINALLY STIFFENED COVERS CONNECTED BY POSTS. Paul Seide. August 1952. 21p. diagr. (NACA TN 2760)

TORSION, COMPRESSION, AND BENDING TESTS OF TUBULAR SECTIONS MACHINED FROM 75S-T6 ROLLED ROUND ROD. R. L. Moore and J. W. Clark, Aluminum Company of America. November 1952. 33p. diagrs., photos., 4 tabs. (NACA RM 52I25)

PRELIMINARY RESULTS OF STABILITY CALCULATIONS FOR THE BENDING OF BOX BEAMS WITH LONGITUDINALLY STIFFENED COVERS CONNECTED BY POSTS. Roger A. Anderson, Thomas W. Wilder, III and Aldie E. Johnson, Jr. December 1952. 17p. diagrs., tab. (NACA RM L52K10a)

THE EFFECT OF LONGITUDINAL STIFFENERS LOCATED ON ONE SIDE OF A PLATE ON THE COMPRESSIVE BUCKLING STRESS OF THE PLATE-STIFFENER COMBINATION. Paul Seide. January 1953. 66p. diagrs., 2 tabs. (NACA TN 2873)

AN ANALYSIS OF STATICALLY INDETERMINATE TRUSSES HAVING MEMBERS STRESSED BEYOND THE PROPORTIONAL LIMIT. Thomas W. Wilder, III. February 1953. 13p. diagrs., 4 tabs. (NACA TN 2886)

DIRECT-READING DESIGN CHARTS FOR 24S-T3 ALUMINUM-ALLOY FLAT COMPRESSION PANELS HAVING LONGITUDINAL FORMED HAT-SECTION STIFFENERS AND COMPARISONS WITH PANELS HAVING Z-SECTION STIFFENERS. William A. Hickman and Norris F. Dow. March 1953. 71p. photos., diagrs., 8 tabs. (NACA TN 2792)

BENDING  
(4.3.7.3)

THE STABILITY OF THE COMPRESSION COVER OF BOX BEAMS STIFFENED BY POSTS. Paul Seide and Paul F. Barrett. 1951. ii, 16p. diagrs., 3 tabs. (NACA Rept. 1047. Formerly TN 2153)

AN EXPERIMENTAL DETERMINATION OF THE CRITICAL BENDING MOMENT OF A BOX BEAM STIFFENED BY POSTS. Paul F. Barrett and Paul Seide. July 1951. 9p. diagrs., photos. (NACA TN 2414)

*Bending (Cont.)*

**STABILITY OF THE CYLINDRICAL SHELL OF VARIABLE CURVATURE.** (Stabilität der Zylinderschale veränderlicher Krümmung). K. Marguerre. July 1951. 64p. diags. (NACA TM 1302. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1671, September 16, 1942).

**RELATIVE STRUCTURAL EFFICIENCIES OF FLAT BALSA-CORE SANDWICH AND STIFFENED-PANEL CONSTRUCTION.** Ralph E. Hubka, Norris F. Dow and Paul Seide. October 1951. 29p. diags. (NACA TN 2514)

**ON THE THEORY OF THIN AND THIN-WALLED RODS.** (K. Teorii Tonkikh i Tonkostennykh Sterzhnei). G. Y. Dzhanlidze. October 1951. 18p. tab. (NACA TM 1309. Trans. from Prikladnaya Matematika i Mekhanika, v.13, Nov.-Dec.1949, p.597-608).

**THEORY OF THIN-WALLED RODS.** (O Teorii Tonkostennykh Sterzhnei). A. L. Goldenveizer. October 1951. 53p. (NACA TM 1322. Trans. from Prikladnaya Matematika i Mekhanika, v.13, Nov.-Dec.1949, p. 561-596).

**FLEXURAL FATIGUE STRENGTHS OF RIVETED BOX BEAMS - ALCLAD 14S-T6, ALCLAD 75S-T6, AND VARIOUS TEMPER OF ALCLAD 24S.** I. D. Eaton and Marshall Holt. Aluminum Company of America. November 1951. 25p. diags., photos., 3 tabs. (NACA TN 2452)

**TORSION AND BENDING OF PRISMATIC RODS OF HOLLOW RECTANGULAR SECTION.** (Kruchenie i Izgib Prismaticeskikh Sterzhnei s Polym Pryamougol'nym Secheniem). B. L. Abramyan. November 1951. 24p. diags., 2 tabs. (NACA TM 1319. Trans. from Prikladnaya Matematika i Mekhanika, v.14, no.3, 1950, p.265-276).

**CRITICAL COMBINATIONS OF BENDING, SHEAR, AND TRANSVERSE COMPRESSIVE STRESSES FOR BUCKLING OF INFINITELY LONG FLAT PLATES.** Aldie E. Johnson, Jr. and Kenneth P. Buchert. December 1951. 40p. diags., 3 tabs. (NACA TN 2536)

**DEFLECTIONS OF A SIMPLY SUPPORTED RECTANGULAR SANDWICH PLATE SUBJECTED TO TRANSVERSE LOADS.** Kuo Tai Yen, Sadettin Gunturkun and Frederick V. Pohle, Polytechnic Institute of Brooklyn. December 1951. 39p. curves, diags., 3 tabs. (NACA TN 2581)

**DEFLECTION AND STRESS ANALYSIS OF THIN SOLID WINGS OF ARBITRARY PLAN FORM WITH PARTICULAR REFERENCE TO DELTA WINGS.** Manuel Stein, J. Edward Anderson and John M. Hedgepeth. February 1952. 53p. photo., diags. (NACA TN 2621)

**DERIVATION OF STABILITY CRITERIONS FOR BOX BEAMS WITH LONGITUDINALLY STIFFENED COVERS CONNECTED BY POSTS.** Paul Seide. August 1952. 21p. diagr. (NACA TN 2760)

**INTRODUCTION TO ELECTRICAL-CIRCUIT ANALOGIES FOR BEAM ANALYSIS.** Stanley U. Benscoter and Richard H. MacNeal, California Institute of Technology. September 1952. 48p. diags., 5 tabs. (NACA TN 2785)

**EQUIVALENT PLATE THEORY FOR A STRAIGHT MULTICELL WING.** Stanley U. Benscoter and Richard H. MacNeal, California Institute of Technology. September 1952. 32p. diags. (NACA TN 2786)

**BENDING OF THIN PLATES WITH COMPOUND CURVATURE.** H. G. Lew, Pennsylvania State College. October 1952. 49p. diags., 2 tabs. (NACA TN 2782)

**TORSION, COMPRESSION, AND BENDING TESTS OF TUBULAR SECTIONS MACHINED FROM 75S-T6 ROLLED ROUND ROD.** R. L. Moore and J. W. Clark, Aluminum Company of America. November 1952. 33p. diags., photos., 4 tabs. (NACA RM 52I25)

**PRELIMINARY RESULTS OF STABILITY CALCULATIONS FOR THE BENDING OF BOX BEAMS WITH LONGITUDINALLY STIFFENED COVERS CONNECTED BY POSTS.** Roger A. Anderson, Thomas W. Wilder, III and Aldie E. Johnson, Jr. December 1952. 17p. diags., tab. (NACA RM L52K10a)

**BEHAVIOR IN PURE BENDING OF A LONG MONOCOQUE BEAM OF CIRCULAR-ARC CROSS SECTION.** Robert W. Fralich, J. Mayers and Eric Reissner. January 1953. 33p. diags. (NACA TN 2875)

**DEFLECTION OF DELTA WINGS HAVING A CARRY-THROUGH-BAY CHORD SMALLER THAN THE WING ROOT CHORD.** Roger W. Peters and Manuel Stein. May 1953. 25p. diags., photo., 2 tabs. (NACA TN 2927)

TORSION  
(4.3.7.4)

**ON THE THEORY OF THIN AND THIN-WALLED RODS.** (K. Teorii Tonkikh i Tonkostennykh Sterzhnei). G. Y. Dzhanlidze. October 1951. 18p. tab. (NACA TM 1309. Trans. from Prikladnaya Matematika i Mekhanika, v.13, Nov.-Dec.1949, p.597-608).

**THEORY OF THIN-WALLED RODS.** (O Teorii Tonkostennykh Sterzhnei). A. L. Goldenveizer. October 1951. 53p. (NACA TM 1322. Trans. from Prikladnaya Matematika i Mekhanika, v.13, Nov.-Dec.1949, p. 561-596).

**TORSION AND BENDING OF PRISMATIC RODS OF HOLLOW RECTANGULAR SECTION.** (Kruchenie i Izgib Prismaticeskikh Sterzhnei s Polym Pryamougol'nym Secheniem). B. L. Abramyan. November 1951. 24p. diags., 2 tabs. (NACA TM 1319. Trans. from Prikladnaya Matematika i Mekhanika, v.14, no.3, 1950, p.265-276).

**STRESSES AND DEFORMATIONS IN WINGS SUBJECTED TO TORSION.** B. F. Ruffner and Eloise Hout, Oregon State College. February 1952. 79p. diags., 23 tabs. (NACA TN 2600)

**DEFLECTION AND STRESS ANALYSIS OF THIN SOLID WINGS OF ARBITRARY PLAN FORM WITH PARTICULAR REFERENCE TO DELTA WINGS.** Manuel Stein, J. Edward Anderson and John M. Hedgepeth. February 1952. 53p. photo., diags. (NACA TN 2621)

## LOADS AND CONSTRUCTION 154 STRUCTURES (4.3)

### Torsion (Cont.)

INTRODUCTION TO ELECTRICAL-CIRCUIT ANALOGIES FOR BEAM ANALYSIS. Stanley U. Bencoter and Richard H. MacNeal, California Institute of Technology. September 1952. 48p. diagrs., 5 tabs. (NACA TN 2785)

EQUIVALENT PLATE THEORY FOR A STRAIGHT MULTICELL WING. Stanley U. Bencoter and Richard H. MacNeal, California Institute of Technology. September 1952. 32p. diagrs. (NACA TN 2786)

TORSION TESTS OF ALUMINUM-ALLOY STIFFENED CIRCULAR CYLINDERS. J. W. Clark and R. L. Moore, Aluminum Company of America. November 1952. 38p. diagrs., photos., 2 tabs. (NACA TN 2821)

TORSION, COMPRESSION, AND BENDING TESTS OF TUBULAR SECTIONS MACHINED FROM 75S-T6 ROLLED ROUND ROD. R. L. Moore and J. W. Clark, Aluminum Company of America. November 1952. 33p. diagrs., photos., 4 tabs. (NACA RM 52I25)

DEFLECTION OF DELTA WINGS HAVING A CARRY-THROUGH-BAY CHORD SMALLER THAN THE WING ROOT CHORD. Roger W. Peters and Manuel Stein. May 1953. 25p. diagrs., photo., 2 tabs. (NACA TN 2927)

### SHEAR (4.3.7.5)

STABILITY OF THE CYLINDRICAL SHELL OF VARIABLE CURVATURE. (Stabilität der Zylinderschale veränderlicher Krümmung). K. Marguerre. July 1951. 64p. diagrs. (NACA TM 1302. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1671, September 16, 1942).

CRITICAL COMBINATIONS OF BENDING, SHEAR, AND TRANSVERSE COMPRESSIVE STRESSES FOR BUCKLING OF INFINITELY LONG FLAT PLATES. Aldie E. Johnson, Jr. and Kenneth P. Buchert. December 1951. 40p. diagrs., 3 tabs. (NACA TN 2536)

EQUAL-STRENGTH DESIGN OF TENSION-FIELD WEBS AND UPRIGHTS. Ralph H. Upson, George M. Phelps and Tung-Sheng Liu, University of Minnesota. January 1952. 46p. diagrs., photos., 4 tabs. (NACA TN 2548)

EFFECT OF TEMPERATURES FROM  $-70^{\circ}$  TO  $600^{\circ}$  F ON STRENGTH OF ADHESIVE-BONDED LAP SHEAR SPECIMENS OF CLAD 24S-T3 ALUMINUM ALLOY AND OF COTTON- AND GLASS-FABRIC PLASTIC LAMINATES. H. W. Eickner, W. Z. Olson and R. F. Blomquist, Forest Products Laboratory. June 1952. 26p. diagrs., 6 tabs. (NACA TN 2717)

STRENGTH ANALYSIS OF STIFFENED THICK BEAM WEBS WITH RATIOS OF WEB DEPTH TO WEB THICKNESS OF APPROXIMATELY 60. L. Ross Levin. May 1953. 11p. photo., diagrs., 2 tabs. (NACA TN 2930)

### CONCENTRATED (4.3.7.6)

ANALYSIS OF PLANE-PLASTIC-STRESS PROBLEMS WITH AXIAL SYMMETRY IN STRAIN-HARDENING RANGE. M. H. Lee Wu. 1951. ii, 23p. diagrs. (NACA Rept. 1021. Formerly NACA TN 2217)

FATIGUE STRENGTHS OF AIRCRAFT MATERIALS. AXIAL-LOAD FATIGUE TESTS ON NOTCHED SHEET SPECIMENS OF 24S-T3 AND 75S-T6 ALUMINUM ALLOYS AND OF SAE 4130 STEEL WITH STRESS-CONCENTRATION FACTORS OF 2.0 AND 4.0. H. J. Grover, S. M. Bishop and L. R. Jackson, Battelle Memorial Institute. June 1951. 64p. diagrs., 14 tabs., photos. (NACA TN 2389)

FATIGUE STRENGTHS OF AIRCRAFT MATERIALS. AXIAL-LOAD FATIGUE TESTS ON NOTCHED SHEET SPECIMENS OF 24S-T3 AND 75S-T6 ALUMINUM ALLOYS AND OF SAE 4130 STEEL WITH STRESS-CONCENTRATION FACTOR OF 5.0. H. J. Grover, S. M. Bishop and L. R. Jackson, Battelle Memorial Institute. June 1951. 19p. diagrs., 8 tabs. (NACA TN 2390)

INVESTIGATION OF THE FATIGUE STRENGTH OF FULL-SCALE AIRPLANE WING STRUCTURES. Dwight O. Fearnow. July 1951. 30p. diagrs., photos., 3 tabs. (NACA RM L51D13a)

A PHOTOELASTIC INVESTIGATION OF STRESS CONCENTRATIONS DUE TO SMALL FILLETS AND GROOVES IN TENSION. M. M. Frocht, Illinois Institute of Technology. August 1951. 45p. diagrs., photos., 5 tabs. (NACA TN 2442)

INVESTIGATION OF TORSION CREEP-TO-RUPTURE PROPERTIES OF N-155 ALLOY. C. W. MacGregor and F. J. Walcott, Jr., Massachusetts Institute of Technology. August 1951. 26p. diagrs., photos., 4 tabs. (NACA RM 51E04)

STRESSES IN A TWO-BAY NONCIRCULAR CYLINDER UNDER TRANSVERSE LOADS. George E. Griffith. October 1951. 34p. diagrs., 3 tabs. (NACA TN 2512)

A STUDY OF ELASTIC AND PLASTIC STRESS CONCENTRATION FACTORS DUE TO NOTCHES AND FILLETS IN FLAT PLATES. Herbert F. Hardrath and Lachlan Ohman. December 1951. 23p. diagrs. (NACA TN 2566)

AN ENGINEERING METHOD FOR ESTIMATING NOTCH-SIZE EFFECT IN FATIGUE TESTS ON STEEL. Paul Kuhn and Herbert F. Hardrath. October 1952. 35p. diagrs., 7 tabs. (NACA TN 2805)

INTERIM REPORT ON A FATIGUE INVESTIGATION OF A FULL-SCALE TRANSPORT AIRCRAFT WING STRUCTURE. M. James McGuigan, Jr. April 1953. 36p. photos., diagrs., 2 tabs. (NACA TN 2920)

### DYNAMIC (4.3.7.7)

SUMMARY OF INFORMATION RELATING TO GUST LOADS ON AIRPLANES. Philip Donely. 1950. iii, 51p. diagrs., photos., 21 tabs. (NACA Rept. 997. Formerly TN 1976)

**Dynamic (Cont.)**

HYDRODYNAMIC IMPACT OF A SYSTEM WITH A SINGLE ELASTIC MODE. II-COMPARISON OF EXPERIMENTAL FORCE AND RESPONSE WITH THEORY. Robert W. Miller and Kenneth F. Merten. 1952. ii, 7p. diagrs., photos., tab. (NACA Rept. 1075. Formerly TN 2343)

INVESTIGATION OF THE STRUCTURAL DAMPING OF A FULL-SCALE AIRPLANE WING. Dwight O. Fearnow. February 1952. 11p. diagrs., photo., tab. (NACA TN 2594. Formerly RM L51A04)

TRANSVERSE VIBRATIONS OF HOLLOW THIN-WALLED CYLINDRICAL BEAMS. Bernard Budiansky and Edwin T. Kruszewski. April 1952. 29p. diagrs. (NACA TN 2682)

INTRODUCTION TO ELECTRICAL-CIRCUIT ANALOGIES FOR BEAM ANALYSIS. Stanley U. Bencsoter and Richard H. MacNeal, California Institute of Technology. September 1952. 48p. diagrs., 5 tabs. (NACA TN 2785)

A STUDY OF THE APPLICATION OF POWER-SPECTRAL METHODS OF GENERALIZED HARMONIC ANALYSIS TO GUST LOADS ON AIRPLANES. Harry Press and Bernard Mazelsky. January 1953. 48p. diagrs., 2 tabs. (NACA TN 2853)

**Repeated  
(4.3.7.7.1)**

INVESTIGATION OF THE FATIGUE STRENGTH OF FULL-SCALE AIRPLANE WING STRUCTURES. Dwight O. Fearnow. July 1951. 30p. diagrs., photos., 3 tabs. (NACA RM L51D13a)

FLEXURAL FATIGUE STRENGTHS OF RIVETED BOX BEAMS - ALCLAD 14S-T6, ALCLAD 75S-T6, AND VARIOUS TEMPER OF ALCLAD 24S. I. D. Eaton and Marshall Holt. Aluminum Company of America. November 1951. 25p. diagrs., photos., 3 tabs. (NACA TN 2452)

AN APPROACH TO THE PREDICTION OF THE FREQUENCY DISTRIBUTION OF GUST LOADS ON AIRPLANES IN NORMAL OPERATIONS. Harry Press. April 1952. 34p. diagrs., 2 tabs. (NACA TN 2660)

THE GUST AND GUST-LOAD EXPERIENCE OF A TWIN-ENGINE LOW-ALTITUDE TRANSPORT AIRPLANT IN OPERATION ON A NORTHERN TRANS-CONTINENTAL ROUTE. Harry Press and Robert L. McDougal. April 1952. 33p. diagrs., 8 tabs. (NACA TN 2663)

FATIGUE AND STATIC TESTS OF FLUSH-RIVETED JOINTS. Darnley M. Howard and Frank C. Smith, National Bureau of Standards. June 1952. 38p. photos., diagrs., 3 tabs. (NACA TN 2709)

AN EXPERIMENTAL INVESTIGATION OF THE BEHAVIOR OF 24S-T4 ALUMINUM ALLOY SUBJECTED TO REPEATED STRESSES OF CONSTANT AND VARYING AMPLITUDES. Herbert F. Hardrath and Elmer C. Utley, Jr. October 1952. 23p. diagrs., 4 tabs. (NACA TN 2798)

AN ENGINEERING METHOD FOR ESTIMATING NOTCH-SIZE EFFECT IN FATIGUE TESTS ON STEEL. Paul Kuhn and Herbert F. Hardrath. October 1952. 35p. diagrs., 7 tabs. (NACA TN 2805)

INTERIM REPORT ON A FATIGUE INVESTIGATION OF A FULL-SCALE TRANSPORT AIRCRAFT WING STRUCTURE. M. James McGuigan, Jr. April 1953. 36p. photos., diagrs., 2 tabs. (NACA TN 2920)

AXIAL-LOAD FATIGUE PROPERTIES OF 24S-T AND 75S-T ALUMINUM ALLOY AS DETERMINED IN SEVERAL LABORATORIES. H. J. Grover and W. S. Hyler, Battelle Memorial Institute, Paul Kuhn and Charles B. Landers, Langley Aeronautical Laboratory and F. M. Howell, Aluminum Company of America. May 1953. 63p. photos., diagrs., 7 tabs. (NACA TN 2928)

**Transient  
(4.3.7.7.2)**

A RECURRENCE MATRIX SOLUTION FOR THE DYNAMIC RESPONSE OF AIRCRAFT IN GUSTS. John C. Houbolt. 1951. ii, 31p. diagrs., 7 tabs. (NACA Rept. 1010. Formerly NACA TN 2060)

EFFECT OF WING FLEXIBILITY AND VARIABLE AIR LIFT UPON WING BENDING MOMENTS DURING LANDING IMPACT OF A SMALL SEAPLANE. Kenneth F. Merten and Edgar B. Beck. 1951. 7p. diagrs., 2 tabs. (NACA Rept. 1013. Formerly TN 2063)

FLIGHT INVESTIGATION OF THE EFFECT OF TRANSIENT WING RESPONSE ON WING STRAINS OF A TWIN-ENGINE TRANSPORT AIRPLANE IN ROUGH AIR. Harry C. Mickleboro and C. C. Shufflebarger. July 1951. 21p. diagrs., 2 tabs. (NACA TN 2424)

THEORETICAL ANALYSIS OF HYDRODYNAMIC IMPACT OF A PRISMATIC FLOAT HAVING FREEDOM IN TRIM. Robert W. Miller. June 1952. 31p. diagrs., 2 tabs. (NACA TN 2698)

ANALYSIS OF LANDING-GEAR BEHAVIOR. Benjamin Milwitzky and Francis E. Cook. August 1952. 98p. diagrs., photo., 3 tabs. (NACA TN 2755)

GUST-RESPONSE ANALYSIS OF AN AIRPLANE INCLUDING WING BENDING FLEXIBILITY. John C. Houbolt and Eldon E. Kordes. August 1952. 48p. diagrs., 3 tabs. (NACA TN 2763)

LANDING-GEAR IMPACT. W. Flüge, Stanford University. October 1952. 91p. diagrs., 9 tabs. (NACA TN 2743)

ON TRAVELING WAVES IN BEAMS. Robert W. Leonard and Bernard Budiansky. January 1953. 76p. diagrs., tab. (NACA TN 2874)

EVALUATION OF GUST RESPONSE CHARACTERISTICS OF SOME EXISTING AIRCRAFT WITH WING BENDING FLEXIBILITY INCLUDED. Eldon E. Kordes and John C. Houbolt. February 1953. 31p. diagrs., 2 tabs. (NACA TN 2897)

**LOADS AND CONSTRUCTION**  
**156 STRUCTURES (4.3)**

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**NORMAL PRESSURES**  
**(4.3.7.8)**

**BUCKLING OF THIN-WALLED CYLINDER UNDER AXIAL COMPRESSION AND INTERNAL PRESSURE.** Hsu Lo, Harold Crate and Edward B. Schwartz. 1951. 9p. diags. (NACA Rept. 1027. Formerly TN 2021)

**BUCKLING OF LOW ARCHES OR CURVED BEAMS OF SMALL CURVATURE.** Y. C. Fung and A. Kaplan, California Institute of Technology. November 1952. 75p. diags., photo., 9 tabs. (NACA TN 2840)

**WEIGHT ANALYSIS**  
**(4.3.8)**

**RELATIVE STRUCTURAL EFFICIENCIES OF FLAT BALSA-CORE SANDWICH AND STIFFENED-PANEL CONSTRUCTION.** Ralph E. Hubka, Norris F. Dow and Paul Seide. October 1951. 29p. diags. (NACA TN 2514)

**CHARTS AND APPROXIMATE FORMULAS FOR THE ESTIMATION OF AEROELASTIC EFFECTS ON THE LOADING OF SWEEPED AND UNSWEEPED WINGS.** Franklin W. Diederich and Kenneth A. Foss. February 1952. 98p. diags., 3 tabs. (NACA TN 2608)

**MATERIALS**  
**(5)**

# MATERIALS

## (5)

A LINEAR TIME-TEMPERATURE RELATION FOR  
EXTRAPOLATION OF CREEP AND STRESS-  
RUPTURE DATA. S. S. Manson and A. M. Haferd.  
March 1953. 49p. diags. (NACA TN 2890)

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## Types (5.1)

OBSERVATIONS ON BAUSCHINGER EFFECT IN COPPER AND BRASS. H. Schwartzbart, M. H. Jones and W. F. Brown, Jr. June 19, 1951. 37p. diags., photo. (NACA RM E51D13)

A THEORY OF CONDUCTIVITY OF COLD-WORKED COPPER. Rolf Landauer. September 1951. 23p. diags. (NACA TN 2439)

RELATIONS BETWEEN THE MODULUS OF ELASTICITY OF BINARY ALLOYS AND THEIR STRUCTURE. (Beziehungen zwischen dem Elastizitätsmodul von Zweistofflegierungen und ihrem Aufbau). Werner Köster and Walter Rauscher. November 1951. 49p. diags. (NACA TM 1321. Trans. from Zeitschrift für Metallkunde, v.39, 1948, p.111-120. Dissertation Technische Hochschule Stuttgart, 1942).

### ALUMINUM (5.1.1)

FATIGUE STRENGTHS OF AIRCRAFT MATERIALS. AXIAL-LOAD FATIGUE TESTS ON NOTCHED SHEET SPECIMENS OF 24S-T3 AND 75S-T6 ALUMINUM ALLOYS AND OF SAE 4130 STEEL WITH STRESS-CONCENTRATION FACTORS OF 2.0 AND 4.0. H. J. Grover, S. M. Bishop and L. R. Jackson, Battelle Memorial Institute. June 1951. 64p. diags., 14 tabs., photos. (NACA TN 2389)

FATIGUE STRENGTHS OF AIRCRAFT MATERIALS. AXIAL-LOAD FATIGUE TESTS ON NOTCHED SHEET SPECIMENS OF 24S-T3 AND 75S-T6 ALUMINUM ALLOYS AND OF SAE 4130 STEEL WITH STRESS-CONCENTRATION FACTOR OF 5.0. H. J. Grover, S. M. Bishop and L. R. Jackson, Battelle Memorial Institute. June 1951. 19p. diags., 8 tabs. (NACA TN 2390)

EFFECTS OF DESIGN DETAILS ON THE FATIGUE STRENGTH OF 355-T6 SAND-CAST ALUMINUM ALLOY. M. Holt and I. D. Eaton, Aluminum Company of America. July 1951. 45p. diags., photos., 5 tabs. (NACA TN 2394)

PLASTIC STRESS-STRAIN RELATIONS FOR 75S-T6 ALUMINUM ALLOY SUBJECTED TO BIAXIAL TENSILE STRESSES. Joseph Marin, B. H. Ulrich and W. P. Hughes, Pennsylvania State College. August 1951. 48p. diags., photos., 5 tabs. (NACA TN 2425)

MECHANICAL AND CORROSION TESTS OF SPOT-WELDED ALUMINUM ALLOYS. Fred M. Reinhart, National Bureau of Standards, and W. F. Hess, R. A. Wyant, F. J. Winsor and R. R. Nash, Rensselaer Polytechnic Institute. December 1951. 74p. diags., photos., 19 tabs. (NACA TN 2538)

A STUDY OF ELASTIC AND PLASTIC STRESS CONCENTRATION FACTORS DUE TO NOTCHES AND FILLETS IN FLAT PLATES. Herbert F. Hardrath and Lachlan Ohman. December 1951. 23p. diags. (NACA TN 2566)

A STUDY OF POISSON'S RATIO IN THE YIELD REGION. George Gerard and Sorrel Wildhorn, New York University. January 1952. 30p. diags., photos. (NACA TN 2561)

INVESTIGATION OF STRESSES DUE TO THERMAL GRADIENTS IN TYPICAL AIRCRAFT STRUCTURES. Martin E. Barzelay and James C. Boison, Syracuse University. January 1952. 90p. diags., photos., tab. (NACA RM 51K06)

DIRECT-READING DESIGN CHARTS FOR 75S-T6 ALUMINUM-ALLOY FLAT COMPRESSION PANELS HAVING LONGITUDINAL EXTRUDED Z-SECTION STIFFENERS. William A. Hickman and Norris F. Dow. February 1952. 60p. diags., photos., 8 tabs. (NACA TN 2435)

CREEP IN METALS. A. D. Schwoppe, F. R. Shober and L. R. Jackson, Battelle Memorial Institute. February 1952. 52p. diags., photos., tab. (NACA TN 2618)

FATIGUE STRENGTHS OF AIRCRAFT MATERIALS. AXIAL-LOAD FATIGUE TESTS ON NOTCHED SHEET SPECIMENS OF 24S-T3 AND 75S-T6 ALUMINUM ALLOYS AND OF SAE 4130 STEEL WITH STRESS-CONCENTRATION FACTOR OF 1.5. H. J. Grover, W. S. Hyler and L. R. Jackson, Battelle Memorial Institute. February 1952. 22p. diags., 9 tabs. (NACA TN 2639)

FATIGUE STRENGTHS OF 14S-T4 ALUMINUM ALLOY SUBJECTED TO BIAXIAL TENSILE STRESSES. Joseph Marin and W. P. Hughes, Pennsylvania State College. June 1952. 24p. photos., diags., 5 tabs. (NACA TN 2704)

FATIGUE AND STATIC TESTS OF FLUSH-RIVETED JOINTS. Darnley M. Howard and Frank C. Smith, National Bureau of Standards. June 1952. 38p. photos., diags., 3 tabs. (NACA TN 2709)

EFFECT OF TEMPERATURES FROM -70° TO 600° F ON STRENGTH OF ADHESIVE-BONDED LAP SHEAR SPECIMENS OF CLAD 24S-T3 ALUMINUM ALLOY AND OF COTTON- AND GLASS-FABRIC PLASTIC LAMINATES. H. W. Eickner, W. Z. Olson and R. F. Blomquist, Forest Products Laboratory. June 1952. 26p. diags., 6 tabs. (NACA TN 2717)

INVESTIGATION OF STATISTICAL NATURE OF FATIGUE PROPERTIES. E. Epremian and R. F. Mehl, Carnegie Institute of Technology. June 1952. ii, 119p. diags., photos., tab. (NACA TN 2719)

PLASTIC STRESS-STRAIN RELATIONS FOR COMBINED TENSION AND COMPRESSION. Joseph Marin and H. A. B. Wiseman, Pennsylvania State College. July 1952. 61p. diags., photos., 2 tabs. (NACA TN 2737)

PREVIEW OF BEHAVIOR OF GRAIN BOUNDARIES IN CREEP OF ALUMINUM BICRYSTALS. F. N. Rhines and A. W. Cochardt, Carnegie Institute of Technology. July 1952. 40p. diags., photos. (NACA TN 2746)



*Aluminum (Cont.)*

AN EXPERIMENTAL INVESTIGATION OF THE BEHAVIOR OF 24S-T4 ALUMINUM ALLOY SUBJECTED TO REPEATED STRESSES OF CONSTANT AND VARYING AMPLITUDES. Herbert F. Hardrath and Elmer C. Utley, Jr. October 1952. 23p. diagrs., 4 tabs. (NACA TN 2798)

EFFECTS OF CYCLIC LOADING ON MECHANICAL BEHAVIOR OF 24S-T4 AND 75S-T6 ALUMINUM ALLOYS AND SAE 4130 STEEL. C. W. MacGregor and N. Grossman. Massachusetts Institute of Technology. October 1952. 53p. diagrs., photos., 4 tabs. (NACA TN 2812)

BEARING STRENGTHS OF SOME 75S-T6 AND 14S-T6 ALUMINUM-ALLOY HAND FORGINGS. E. M. Finley, Aluminum Company of America. January 1953. 24p. diagrs., photos., 4 tabs. (NACA TN 2883)

DIRECT-READING DESIGN CHARTS FOR 24S-T3 ALUMINUM-ALLOY FLAT COMPRESSION PANELS HAVING LONGITUDINAL FORMED HAT-SECTION STIFFENERS AND COMPARISONS WITH PANELS HAVING Z-SECTION STIFFENERS. William A. Hickman and Norris F. Dow. March 1953. 71p. photos., diagrs., 8 tabs. (NACA TN 2792)

A LINEAR TIME-TEMPERATURE RELATION FOR EXTRAPOLATION OF CREEP AND STRESS-RUPTURE DATA. S. S. Manson and A. M. Haferd. March 1953. 49p. diagrs. (NACA TN 2890)

COMBINED-STRESS FATIGUE STRENGTH OF 76S-T61 ALUMINUM ALLOY WITH SUPERIMPOSED MEAN STRESSES AND CORRECTIONS FOR YIELDING. William N. Findley, University of Illinois. May 1953. 90p. diagrs., photos., 3 tabs. (NACA TN 2924)

AXIAL-LOAD FATIGUE PROPERTIES OF 24S-T AND 75S-T ALUMINUM ALLOY AS DETERMINED IN SEVERAL LABORATORIES. H. J. Grover and W. S. Hyler, Battelle Memorial Institute, Paul Kuhn and Charles B. Landers, Langley Aeronautical Laboratory and F. M. Howell, Aluminum Company of America. May 1953. 63p. photos., diagrs., 7 tabs. (NACA TN 2928)

THE CREEP OF SINGLE CRYSTALS OF ALUMINUM. R. D. Johnson, F. R. Shober and A. D. Schwoppe, Battelle Memorial Institute. May 1953. 51p. diagrs., photos., tab. (NACA TN 2945)

## MAGNESIUM

### (5.1.2)

CORROSION OF MAGNESIUM ALLOY ZK60A IN MARINE ATMOSPHERE AND TIDEWATER. Fred M. Reinhart, National Bureau of Standards. February 1952. 10p. photos., 4 tabs. (NACA TN 2632)

EFFECT OF OPEN CIRCULAR HOLES ON TENSILE STRENGTH AND ELONGATION OF SHEET SPECIMENS OF A MAGNESIUM ALLOY. R. S. Barker, Aluminum Company of America. June 1952. 24p. diagrs., 6 tabs. (NACA TN 2716)

## STEELS

### (5.1.3)

FATIGUE STRENGTHS OF AIRCRAFT MATERIALS. AXIAL-LOAD FATIGUE TESTS ON NOTCHED SHEET SPECIMENS OF 24S-T3 AND 75S-T6 ALUMINUM ALLOYS AND OF SAE 4130 STEEL WITH STRESS-CONCENTRATION FACTORS OF 2.0 AND 4.0. H. J. Grover, S. M. Bishop and L. R. Jackson, Battelle Memorial Institute. June 1951. 64p. diagrs., 14 tabs., photos. (NACA TN 2389)

FATIGUE STRENGTHS OF AIRCRAFT MATERIALS. AXIAL-LOAD FATIGUE TESTS ON NOTCHED SHEET SPECIMENS OF 24S-T3 AND 75S-T6 ALUMINUM ALLOYS AND OF SAE 4130 STEEL WITH STRESS-CONCENTRATION FACTOR OF 5.0. H. J. Grover, S. M. Bishop and L. R. Jackson, Battelle Memorial Institute. June 1951. 19p. diagrs., 8 tabs. (NACA TN 2390)

A CRITICAL REVIEW OF NOTCH SENSITIVITY IN STRESS-RUPTURE TESTS. W. F. Brown, Jr. and George Sachs. August 1951. 29p. diagrs. (NACA TN 2433)

CERAMIC COATINGS FOR PREVENTION OF CARBON ABSORPTION IN FOUR HEAT-RESISTANT ALLOYS. Joseph W. Pitts and Dwight G. Moore, National Bureau of Standards. December 1951. 14p. diagrs., photos., 3 tabs. (NACA TN 2572)

FATIGUE STRENGTHS OF AIRCRAFT MATERIALS. AXIAL-LOAD FATIGUE TESTS ON NOTCHED SHEET SPECIMENS OF 24S-T3 AND 75S-T6 ALUMINUM ALLOYS AND OF SAE 4130 STEEL WITH STRESS-CONCENTRATION FACTOR OF 1.5. H. J. Grover, W. S. Hyler and L. R. Jackson, Battelle Memorial Institute. February 1952. 22p. diagrs., 9 tabs. (NACA TN 2639)

A FUNDAMENTAL STUDY OF THE MECHANISM BY WHICH HYDROGEN ENTERS METALS DURING CHEMICAL AND ELECTROCHEMICAL PROCESSING. L. D. McGraw, C. A. Shively, H. L. Moore, P. T. Woodberry and C. L. Faust, Battelle Memorial Institute. April 1952. ii, 43p. photos., diagrs., 6 tabs. (NACA TN 2696)

INVESTIGATION OF STATISTICAL NATURE OF FATIGUE PROPERTIES. E. Epremian and R. F. Mehl, Carnegie Institute of Technology. June 1952. ii, 119p. diagrs., photos., tab. (NACA TN 2719)

THE OXIDATION OF METALS AND ALLOYS. (Über das Zundern von Metalle und Legierungen). Erich Scheil. June 1952. 16p. diagrs., photos. (NACA TM 1338. Trans. from Zeitschrift für Metallkunde, v. 29, July 1937, p. 209-214).

AN ENGINEERING METHOD FOR ESTIMATING NOTCH-SIZE EFFECT IN FATIGUE TESTS ON STEEL. Paul Kuhn and Herbert F. Hardrath. October 1952. 35p. diagrs., 7 tabs. (NACA TN 2805)

EFFECTS OF CYCLIC LOADING ON MECHANICAL BEHAVIOR OF 24S-T4 AND 75S-T6 ALUMINUM ALLOYS AND SAE 4130 STEEL. C. W. MacGregor and N. Grossman. Massachusetts Institute of Technology. October 1952. 53p. diagrs., photos., 4 tabs. (NACA TN 2812)

## MATERIALS 160 TYPES (5.1)

### Steels (Cont.)

INFLUENCE OF NONMARTENSITIC TRANSFORMATION PRODUCTS ON MECHANICAL PROPERTIES OF TEMPERED MARTENSITE. J. M. Hodge and W. T. Lankford, United States Steel Company. December 1952. 13p. diagrs., 4 tabs. (NACA TN 2862)

A LINEAR TIME-TEMPERATURE RELATION FOR EXTRAPOLATION OF CREEP AND STRESS-RUPTURE DATA. S. S. Manson and A. M. Haferd. March 1953. 49p. diagrs. (NACA TN 2890)

## HEAT-RESISTING ALLOYS (5.1.4)

FUNDAMENTAL EFFECTS OF AGING ON CREEP PROPERTIES OF SOLUTION-TREATED LOW-CARBON N-155 ALLOY. D. N. Frey, J. W. Freeman and A. E. White, University of Michigan. 1950. ii, 30p. diagrs., photos., 5 tabs. (NACA Rept. 1001. Formerly TN 1940)

DIFFUSION OF CHROMIUM IN ALPHA COBALT-CHROMIUM SOLID SOLUTIONS. John W. Weeton. 1951. ii, 15p. diagrs., photos., tab. (NACA Rept. 1023. Formerly TN 2218)

INFLUENCE OF CHEMICAL COMPOSITION ON RUPTURE PROPERTIES AT 1200° F OF FORGED CHROMIUM-COBALT-NICKEL-IRON BASE ALLOYS IN SOLUTION-TREATED AND AGED CONDITION. E. E. Reynolds, J. W. Freeman and A. E. White, University of Michigan. 1951. ii, 60p. diagrs., photos., 11 tabs. (NACA Rept. 1058. Formerly TN 2449)

EFFECTIVENESS OF CERAMIC COATINGS IN REDUCING CORROSION OF FIVE HEAT-RESISTANT ALLOYS BY LEAD-BROMIDE VAPORS. Dwight G. Moore and Mary W. Mason, National Bureau of Standards. June 1951. 24p. diagrs., photos., 4 tabs. (NACA TN 2380)

FUNDAMENTAL AGING EFFECTS INFLUENCING HIGH-TEMPERATURE PROPERTIES OF SOLUTION-TREATED INCONEL X. D. N. Frey, J. W. Freeman and A. E. White, University of Michigan. June 1951. 70p. diagrs., photos., 6 tabs. (NACA TN 2385)

EFFECT OF SURFACE FINISH ON FATIGUE PROPERTIES AT ELEVATED TEMPERATURES. I - LOW-CARBON N-155 WITH GRAIN SIZE OF A.S.T.M. 1. Robert R. Ferguson. June 26, 1951. 18p. diagrs., photos., 2 tabs. (NACA RM E51D17)

A CRITICAL REVIEW OF NOTCH SENSITIVITY IN STRESS-RUPTURE TESTS. W. F. Brown, Jr. and George Sachs. August 1951. 29p. diagrs. (NACA TN 2433)

KINETICS OF SINTERING CHROMIUM CARBIDE. W. G. Lidman and H. J. Hamjian. August 1951. 16p. diagrs., photos., tab. (NACA TN 2491)

INVESTIGATION OF TORSION CREEP-TO-RUPTURE PROPERTIES OF N-155 ALLOY. C. W. MacGregor and F. J. Walcott, Jr., Massachusetts Institute of Technology. August 1951. 26p. diagrs., photos., 4 tabs. (NACA RM 51E04)

RUPTURE PROPERTIES OF LOW-CARBON N-155 TYPE ALLOYS MADE WITH A COLUMBIUM-TANTALUM FERRO-ALLOY. J. W. Freeman, E. E. Reynolds and A. E. White, University of Michigan. October 1951. 11p. diagrs., 2 tabs. (NACA TN 2469)

FUNDAMENTAL EFFECTS OF COLD-WORKING ON CREEP PROPERTIES OF LOW-CARBON N-155 ALLOY. D. N. Frey, J. W. Freeman and A. E. White, University of Michigan. October 1951. 45p. diagrs., photos. (NACA TN 2472)

EFFECTS OF SOME SOLUTION TREATMENTS FOLLOWED BY AN AGING TREATMENT ON THE LIFE OF SMALL CAST GAS-TURBINE BLADES OF A COBALT-CHROMIUM-BASE ALLOY. II - EFFECT OF SELECTED COMBINATIONS OF SOAKING TIME, TEMPERATURE, AND COOLING RATE. C. A. Hoffman and C. F. Robards. October 1951. 19p. diagrs., photos., 4 tabs. (NACA TN 2513)

CERAMIC COATINGS FOR PREVENTION OF CARBON ABSORPTION IN FOUR HEAT-RESISTANT ALLOYS. Joseph W. Pitts and Dwight G. Moore, National Bureau of Standards. December 1951. 14p. diagrs., photos., 3 tabs. (NACA TN 2572)

FUNDAMENTAL EFFECTS OF COLD-WORK ON SOME COBALT-CHROMIUM-NICKEL-IRON BASE CREEP-RESISTANT ALLOYS. D. N. Frey, J. W. Freeman and A. E. White, University of Michigan. January 1952. 12p. diagrs. (NACA TN 2586)

SURVEY OF THE CHROMIUM-COBALT-NICKEL PHASE DIAGRAM AT 1200° C. W. D. Manly and Paul A. Beck, University of Notre Dame. February 1952. 45p. diagrs., photos., 9 tab. (NACA TN 2602)

SURVEY OF PORTIONS OF THE COBALT-CHROMIUM-IRON-NICKEL QUATERNARY SYSTEM. E. L. Kamen and Paul A. Beck. February 1952. 62p. photos., diagrs., 13 tabs. (NACA TN 2603)

ABNORMAL GRAIN GROWTH IN S-816 ALLOY. A. I. Rush, J. W. Freeman and A. E. White, University of Michigan. April 1952. 30p. photos., diagrs., tab. (NACA TN 2678)

SURVEY OF PORTIONS OF THE CHROMIUM-COBALT-NICKEL-MOLYBDENUM QUATERNARY SYSTEM AT 1200° C. Sheldon Paul Rideout and Paul A. Beck, University of Notre Dame. April 1952. 81p. diagrs., photos., 20 tabs. (NACA TN 2683)

INFLUENCE OF STRUCTURE ON PROPERTIES OF SINTERED CHROMIUM CARBIDE. H. J. Hamjian and W. G. Lidman. June 1952. 21p. diagrs., photos., 5 tabs. (NACA TN 2731)

INFLUENCE OF CHEMICAL COMPOSITION ON RUPTURE TEST PROPERTIES AT 1500° F OF FORGED CHROMIUM-COBALT-NICKEL-IRON BASE ALLOYS. J. W. Freeman, J. F. Ewing and A. E. White, University of Michigan. July 1952. 69p. diagrs., photos., 2 tabs. (NACA TN 2745)

SURVEY OF PORTIONS OF THE IRON-NICKEL-MOLYBDENUM AND COBALT-IRON-MOLYBDENUM TERNARY SYSTEMS AT 1200° C. Dilip K. Das and Paul A. Beck, University of Notre Dame. February 1953. 56p. diagrs., photos., 15 tabs. (NACA TN 2896)

*Heat-Resisting Alloys (Cont.)*

A LINEAR TIME-TEMPERATURE RELATION FOR EXTRAPOLATION OF CREEP AND STRESS-RUPTURE DATA. S. S. Manson and A. M. Haferd. March 1953. 49p. diagrs. (NACA TN 2890)

EFFECT OF PROCESSING VARIABLES ON THE TRANSITION TEMPERATURE, STRENGTH, AND DUCTILITY OF HIGH-PURITY, SINTERED, WROUGHT MOLYBDENUM METAL. Kenneth C. Dike and Roger A. Long. March 1953. 26p. diagrs., photos., 3 tabs. (NACA TN 2915)

## CERAMICS (5.1.5)

COOLING OF GAS TURBINES. IX - COOLING EFFECTS FROM USE OF CERAMIC COATINGS ON WATER-COOLED TURBINE BLADES. W. Byron Brown and John N. B. Livingood. October 13, 1948. 26p. diagrs. (NACA RM E8H03) (Declassified from Restricted, 6/11/53)

COMPARISON OF NATIONAL BUREAU OF STANDARDS CERAMIC COATINGS L-7C AND A-417 ON TURBINE BLADES IN A TURBOJET ENGINE. C. Robert Morse. December 22, 1948. photos., 5 tabs. (NACA RM E8I20) (Declassified from Restricted, 3/28/52)

EFFECTIVENESS OF CERAMIC COATINGS IN REDUCING CORROSION OF FIVE HEAT-RESISTANT ALLOYS BY LEAD-BROMIDE VAPORS. Dwight G. Moore and Mary W. Mason, National Bureau of Standards. June 1951. 24p. diagrs., photos., 4 tabs. (NACA TN 2380)

STUDIES OF HIGH-TEMPERATURE PROTECTION OF A TITANIUM-CARBIDE CERAMAL BY CHROMIUM-TYPE CERAMIC-METAL COATINGS. Dwight G. Moore, Stanley G. Benner and William N. Harrison, National Bureau of Standards. June 1951. 24p. diagrs., photos., 8 tabs. (NACA TN 2386)

STUDY OF CHROMIUM-FRIT-TYPE COATINGS FOR HIGH-TEMPERATURE PROTECTION OF MOLYBDENUM. D. G. Moore, L. H. Bolz, J. W. Pitts and W. N. Harrison, National Bureau of Standards. July 1951. 39p. diagrs., photos., 9 tabs. (NACA TN 2422)

KINETICS OF SINTERING CHROMIUM CARBIDE. W. G. Lidman and H. J. Hamjian. August 1951. 16p. diagrs., photos., tab. (NACA TN 2491)

CERAMIC COATINGS FOR PREVENTION OF CARBON ABSORPTION IN FOUR HEAT-RESISTANT ALLOYS. Joseph W. Pitts and Dwight G. Moore, National Bureau of Standards. December 1951. 14p. diagrs., photos., 3 tabs. (NACA TN 2572)

RELATIVE IMPORTANCE OF VARIOUS SOURCES OF DEFECT-PRODUCING HYDROGEN INTRODUCED INTO STEEL DURING APPLICATION OF VITREOUS COATINGS. Dwight G. Moore, Mary A. Mason and William N. Harrison, National Bureau of Standards. February 1952. 31p. photos., diagrs., 5 tabs. (NACA TN 2617)

MIGRATION OF COBALT DURING FIRING OF GROUND-COAT ENAMELS ON IRON. William N. Harrison, Joseph C. Richmond, Joseph W. Pitts and Stanley G. Benner, National Bureau of Standards. June 1952. 28p. photos., 5 tabs. (NACA TN 2695)

INFLUENCE OF STRUCTURE ON PROPERTIES OF SINTERED CHROMIUM CARBIDE. H. J. Hamjian and W. G. Lidman. June 1952. 21p. diagrs., photos., 5 tabs. (NACA TN 2731)

INVESTIGATION OF EFFECTIVE THERMAL CONDUCTIVITIES OF POWDERS. R. G. Deissler and C. S. Eian. June 1952. 44p. diagrs., tab. (NACA RM E52C05)

INVESTIGATION OF GASES EVOLVED DURING FIRING OF VITREOUS COATINGS ON STEEL. Dwight G. Moore and Mary A. Mason, National Bureau of Standards. January 1953. 34p. diagrs., photos., 7 tabs. (NACA TN 2865)

RELATION BETWEEN ROUGHNESS OF INTERFACE AND ADHERENCE OF PORCELAIN ENAMEL TO STEEL. J. C. Richmond, D. G. Moore, H. B. Kirkpatrick and W. N. Harrison, National Bureau of Standards. April 1953. 29p. diagrs., photos., 7 tabs. (NACA TN 2934)

## PLASTICS (5.1.6)

EFFECT OF FUEL IMMERSION ON LAMINATED PLASTICS. W. A. Crouse, Margie Carickhoff and Margaret A. Fisher, National Bureau of Standards. June 1951. 34p. diagrs., photos., 9 tabs. (NACA TN 2377)

EFFECTS OF HUMIDITY DURING FABRICATION ON SOME PHYSICAL PROPERTIES OF GLASS-FABRIC UNSATURATED-POLYESTER LAMINATES. John E. Wier, Dorothy C. Pons and Benjamin M. Axilrod, National Bureau of Standards. July 1951. 36p. diagrs., 8 tabs. (NACA RM 51C21)

EFFECT OF STRESS-SOLVENT CRAZING ON TENSILE STRENGTH OF POLYMETHYL METHACRYLATE. B. M. Axilrod and Martha A. Sherman, National Bureau of Standards. August 1951. 19p. photos., 4 tabs. (NACA TN 2444)

EFFECT OF TEMPERATURES FROM -70° TO 600° F ON STRENGTH OF ADHESIVE-BONDED LAP SHEAR SPECIMENS OF CLAD 24S-T3 ALUMINUM ALLOY AND OF COTTON- AND GLASS-FABRIC PLASTIC LAMINATES. H. W. Eickner, W. Z. Olson and R. F. Blomquist, Forest Products Laboratory. June 1952. 26p. diagrs., 6 tabs. (NACA TN 2717)

STRESS AND STRAIN AT ONSET OF CRAZING OF POLYMETHYL METHACRYLATE AT VARIOUS TEMPERATURES. M. A. Sherman and B. M. Axilrod, National Bureau of Standards. September 1952. 21p. diagrs., photos., 3 tabs. (NACA TN 2778)

EFFECTS OF MODERATE BIAXIAL STRETCH-FORMING ON TENSILE AND CRAZING PROPERTIES OF ACRYLIC PLASTIC GLAZING. B. M. Axilrod, M. A. Sherman, V. Cohen and I. Wolock, National Bureau of Standards. October 1952. 42p. photos., diagrs., 4 tabs. (NACA TN 2779)

## MATERIALS 162 TYPES (5.1)

### Plastics (Cont.)

**EFFECTS OF HIGH DEGREES OF BIAxIAL STRETCH-FORMING ON CRAZING AND OTHER PROPERTIES OF ACRYLIC PLASTIC GLAZING.** I. Wolock, B. M. Axilrod and M. A. Sherman. National Bureau of Standards. May 1953. 18p. photos., diagrs., 3 tabs. (NACA RM 53D14)

## ADHESIVES

### (5.1.8)

**EFFECT OF TEMPERATURES FROM -70° TO 600° F ON STRENGTH OF ADHESIVE-BONDED LAP SHEAR SPECIMENS OF CLAD 24S-T3 ALUMINUM ALLOY AND OF COTTON- AND GLASS-FABRIC PLASTIC LAMINATES.** H. W. Eickner, W. Z. Olson and R. F. Blomquist, Forest Products Laboratory. June 1952. 26p. diagrs., 6 tabs. (NACA TN 2717)

## PROTECTIVE COATINGS

### (5.1.9)

**COMPARISON OF NATIONAL BUREAU OF STANDARDS CERAMIC COATINGS L-7C AND A-417 ON TURBINE BLADES IN A TURBOJET ENGINE.** C. Robert Morse. December 22, 1948. photos., 5 tabs. (NACA RM E8120) (Declassified from Restricted, 3/28/52)

**EFFECTIVENESS OF CERAMIC COATINGS IN REDUCING CORROSION OF FIVE HEAT-RESISTANT ALLOYS BY LEAD-BROMIDE VAPORS.** Dwight G. Moore and Mary W. Mason, National Bureau of Standards. June 1951. 24p. diagrs., photos., 4 tabs. (NACA TN 2380)

**STUDIES OF HIGH-TEMPERATURE PROTECTION OF A TITANIUM-CARBIDE CERAMAL BY CHROMIUM-TYPE CERAMIC-METAL COATINGS.** Dwight G. Moore, Stanley G. Benner and William N. Harrison, National Bureau of Standards. June 1951. 24p. diagrs., photos., 8 tabs. (NACA TN 2386)

**STUDY OF CHROMIUM-FRIT-TYPE COATINGS FOR HIGH-TEMPERATURE PROTECTION OF MOLYBDENUM.** D. G. Moore, L. H. Bolz, J. W. Pitts and W. N. Harrison, National Bureau of Standards. July 1951. 39p. diagrs., photos., 9 tabs. (NACA TN 2422)

**KINETICS OF SINTERING CHROMIUM CARBIDE.** W. G. Lidman and H. J. Hamjian. August 1951. 16p. diagrs., photos., tab. (NACA TN 2491)

**CERAMIC COATINGS FOR PREVENTION OF CARBON ABSORPTION IN FOUR HEAT-RESISTANT ALLOYS.** Joseph W. Pitts and Dwight G. Moore, National Bureau of Standards. December 1951. 14p. diagrs., photos., 3 tabs. (NACA TN 2572)

**RELATIVE IMPORTANCE OF VARIOUS SOURCES OF DEFECT-PRODUCING HYDROGEN INTRODUCED INTO STEEL DURING APPLICATION OF VITREOUS COATINGS.** Dwight G. Moore, Mary A. Mason and William N. Harrison, National Bureau of Standards. February 1952. 31p. photos., diagrs., 5 tabs. (NACA TN 2617)

**MIGRATION OF COBALT DURING FIRING OF GROUND-COAT ENAMELS ON IRON.** William N. Harrison, Joseph C. Richmond, Joseph W. Pitts and Stanley G. Benner, National Bureau of Standards. June 1952. 28p. photos., 5 tabs. (NACA TN 2695)

**INFLUENCE OF STRUCTURE ON PROPERTIES OF SINTERED CHROMIUM CARBIDE.** H. J. Hamjian and W. G. Lidman. June 1952. 21p. diagrs., photos., 5 tabs. (NACA TN 2731)

**VELOCITY OF ACTION OF OXYGEN, HYDROGEN SULFIDE, AND HALOGENS ON METALS.** (Die Geschwindigkeit der Einwirkung von Sauerstoff, Schwefelwasserstoff, und Halogenen auf Metalle). G. Tammann and W. Köster. June 1952. 21p. diagrs., 20 tabs. (NACA TM 1339. Trans. from Zeitschrift für anorganische und allgemeine Chemie, v. 123, August 1922, p. 196-201 and 208-224).

**THE OXIDATION OF METALS AND ALLOYS.** (Über das Zundern von Metalle und Legierungen). Erich Scheil. June 1952. 16p. diagrs., photos. (NACA TM 1338. Trans. from Zeitschrift für Metallkunde, v. 29, July 1937, p. 209-214).

**INVESTIGATION OF GASES EVOLVED DURING FIRING OF VITREOUS COATINGS ON STEEL.** Dwight G. Moore and Mary A. Mason, National Bureau of Standards. January 1953. 34p. diagrs., photos., 7 tabs. (NACA TN 2865)

**RELATION BETWEEN ROUGHNESS OF INTERFACE AND ADHERENCE OF PORCELAIN ENAMEL TO STEEL.** J. C. Richmond, D. G. Moore, H. B. Kirkpatrick and W. N. Harrison, National Bureau of Standards. April 1953. 29p. diagrs., photos., 7 tabs. (NACA TN 2934)

## SANDWICH & LAMINATES

### (5.1.11)

**A SMALL-DEFLECTION THEORY FOR CURVED SANDWICH PLATES.** Manuel Stein and J. Mayers. 1951. 6p. diagrs. (NACA Rept. 1008. Formerly NACA TN 2017)

**EFFECT OF FUEL IMMERSION ON LAMINATED PLASTICS.** W. A. Crouse, Margie Carickhoff and Margaret A. Fisher, National Bureau of Standards. June 1951. 34p. diagrs., photos., 9 tabs. (NACA TN 2377)

**EFFECTS OF HUMIDITY DURING FABRICATION ON SOME PHYSICAL PROPERTIES OF GLASS-FABRIC UNSATURATED-POLYESTER LAMINATES.** John E. Wier, Dorothy C. Pons and Benjamin M. Axilrod, National Bureau of Standards. July 1951. 36p. diagrs., 8 tabs. (NACA RM 51C21)

**RELATIVE STRUCTURAL EFFICIENCIES OF FLAT BALSA-CORE SANDWICH AND STIFFENED-PANEL CONSTRUCTION.** Ralph E. Hubka, Norris F. Dow and Paul Seide. October 1951. 29p. diagrs. (NACA TN 2514)

**PROPERTIES OF HONEYCOMB CORES AS AFFECTED BY FIBER TYPE, FIBER ORIENTATION, RESIN TYPE, AND AMOUNT.** R. J. Seidl, D. J. Fahey and A. W. Voss, Forest Products Laboratory. November 1951. 36p. diagrs., photos., 6 tabs. (NACA TN 2564)

*Sandwich and Laminates (Cont.)*

DEFLECTIONS OF A SIMPLY SUPPORTED RECTANGULAR SANDWICH PLATE SUBJECTED TO TRANSVERSE LOADS. Kuo Tai Yen, Sadettin Gunturkun and Frederick V. Pohle, Polytechnic Institute of Brooklyn. December 1951. 39p. curves, diagrs., 3 tabs. (NACA TN 2581)

BUCKLING OF RECTANGULAR SANDWICH PLATES SUBJECTED TO EDGEWISE COMPRESSION WITH LOADED EDGES SIMPLY SUPPORTED AND UNLOADED EDGES CLAMPED. Kuo Tai Yen, V. L. Salerno and N. J. Hoff. Polytechnic Institute of Brooklyn. January 1952. 66p. diagrs., tab. (NACA TN 2556)

COMPRESSIVE BUCKLING OF SIMPLY SUPPORTED CURVED PLATES AND CYLINDERS OF SANDWICH CONSTRUCTION. Manuel Stein and J. Mayers. January 1952. 34p. diagrs. (NACA TN 2601)

PRINCIPLE AND APPLICATION OF COMPLEMENTARY ENERGY METHOD FOR THIN HOMOGENEOUS AND SANDWICH PLATES AND SHELLS WITH FINITE DEFLECTIONS. Chi-Teh Wang, New York University. February 1952. 33p. diagrs. (NACA TN 2620)

COMPRESSIVE BUCKLING OF FLAT RECTANGULAR METALITE TYPE SANDWICH PLATES WITH SIMPLY SUPPORTED LOADED EDGES AND CLAMPED UNLOADED EDGES. (Revised) Paul Seide. February 1952. 27p. diagrs., 3 tabs. (NACA TN 2637) (Superseded TN 1886, May 1949)

THE STABILITY UNDER LONGITUDINAL COMPRESSION OF FLAT SYMMETRIC CORRUGATED-CORE SANDWICH PLATES WITH SIMPLY SUPPORTED LOADED EDGES AND SIMPLY SUPPORTED OR CLAMPED UNLOADED EDGES. Paul Seide. April 1952. 27p. diagrs. (NACA TN 2679)

EFFECT OF TEMPERATURES FROM  $-70^{\circ}$  TO  $600^{\circ}$ F ON STRENGTH OF ADHESIVE-BONDED LAP SHEAR SPECIMENS OF CLAD 24S-T3 ALUMINUM ALLOY AND OF COTTON- AND GLASS-FABRIC PLASTIC LAMINATES. H. W. Eickner, W. Z. Olson and R. F. Blomquist, Forest Products Laboratory. June 1952. 26p. diagrs., 6 tabs. (NACA TN 2717)

**CERAMALS**  
**(5.1.12)**

ELEVATED TEMPERATURE PROPERTIES OF TITANIUM CARBIDE BASE CERAMALS CONTAINING NICKEL OR IRON: A. L. Cooper and L. E. Colteryahn. December 1951. 47p. photos., diagrs., 5 tabs. (NACA RM E51110)

STUDIES OF HIGH-TEMPERATURE PROTECTION OF A TITANIUM-CARBIDE CERAMAL BY CHROMIUM-TYPE CERAMIC-METAL COATINGS. Dwight G. Moore, Stanley G. Benner and William N. Harrison, National Bureau of Standards. June 1951. 24p. diagrs., photos., 8 tabs. (NACA TN 2386)

KINETICS OF SINTERING CHROMIUM CARBIDE. W. G. Lidman and H. J. Hamjian. August 1951. 16p. diagrs., photos., tab. (NACA TN 2491)

INFLUENCE OF STRUCTURE ON PROPERTIES OF SINTERED CHROMIUM CARBIDE. H. J. Hamjian and W. G. Lidman. June 1952. 21p. diagrs., photos., 5 tabs. (NACA TN 2731)

## Properties

### (5.2)

**STUDY OF CHROMIUM-FRIT-TYPE COATINGS FOR HIGH-TEMPERATURE PROTECTION OF MOLYBDENUM.** D. G. Moore, L. H. Bolz, J. W. Pitts and W. N. Harrison, National Bureau of Standards. July 1951. 39p. diags., photos., 9 tabs. (NACA TN 2422)

**EFFECTS OF HUMIDITY DURING FABRICATION ON SOME PHYSICAL PROPERTIES OF GLASS-FABRIC UNSATURATED-POLYESTER LAMINATES.** John E. Wier, Dorothy C. Pons and Benjamin M. Axilrod, National Bureau of Standards. July 1951. 36p. diags., 8 tabs. (NACA RM 51C21)

**X-RAY DIFFRACTION BY BENT CRYSTAL LAMELLAE.** Hans Ekstein, Armour Research Foundation. September 1951. 14p. diags. (NACA TN 2448)

**ESTIMATION OF NEUTRON ENERGY FOR FIRST RESONANCE FROM ABSORPTION CROSS SECTION FOR THERMAL NEUTRONS.** Donald Bogart. September 1951. 18p. diags., 4 tabs. (NACA RM E51G03)

**A SPECIALLY CONSTRUCTED METALLOGRAPH FOR USE AT ELEVATED TEMPERATURES.** Joe E. Jenkins, Donald R. Buchele and Roger A. Long. September 1951. 21p. diags., photos. (NACA RM E51G12)

**INVESTIGATION OF EFFECTIVE THERMAL CONDUCTIVITIES OF POWDERS.** R. G. Deissler and C. S. Eian. June 1952. 44p. diags., tab. (NACA RM E52C05)

**SECTION CHARACTERISTICS OF A 10.5-PERCENT-THICK AIRFOIL WITH AREA SUCTION AS AFFECTED BY CHORDWISE DISTRIBUTION OF PERMEABILITY.** Robert E. Dannenberg and James A. Weiberg. December 1952. 52p. diags., photos., 3 tabs. (NACA TN 2847)

**BEARING STRENGTHS OF SOME 75S-T6 AND 14S-T6 ALUMINUM-ALLOY HAND FORGINGS.** E. M. Finley, Aluminum Company of America. January 1953. 24p. diags., photos., 4 tabs. (NACA TN 2883)

## TENSILE

### (5.2.1)

**INFLUENCE OF TENSILE STRENGTH AND DUCTILITY ON STRENGTHS OF ROTATING DISKS IN PRESENCE OF MATERIAL AND FABRICATION DEFECTS OF SEVERAL TYPES.** Arthur G. Holms, Joseph E. Jenkins and Andrew J. Repko. June 1951. 39p. diags., photos., tab. (NACA TN 2397)

**OBSERVATIONS ON BAUSCHINGER EFFECT IN COPPER AND BRASS.** H. Schwartzbart, M. H. Jones and W. F. Brown, Jr. June 19, 1951. 37p. diags., photo. (NACA RM E51D13)

**EFFECTS OF DESIGN DETAILS ON THE FATIGUE STRENGTH OF 355-T6 SAND-CAST ALUMINUM ALLOY.** M. Holt and I. D. Eaton, Aluminum Company of America. July 1951. 45p. diags., photos., 5 tabs. (NACA TN 2394)

**A PHOTOELASTIC INVESTIGATION OF STRESS CONCENTRATIONS DUE TO SMALL FILLETS AND GROOVES IN TENSION.** M. M. Frocht, Illinois Institute of Technology. August 1951. 45p. diags., photos., 5 tabs. (NACA TN 2442)

**EFFECT OF STRESS-SOLVENT CRAZING ON TENSILE STRENGTH OF POLYMETHYL METHACRYLATE.** B. M. Axilrod and Martha A. Sherman, National Bureau of Standards. August 1951. 19p. photos., 4 tabs. (NACA TN 2444)

**PROPERTIES OF HONEYCOMB CORES AS AFFECTED BY FIBER TYPE, FIBER ORIENTATION, RESIN TYPE, AND AMOUNT.** R. J. Seidl, D. J. Fahey and A. W. Voss, Forest Products Laboratory. November 1951. 36p. diags., photos., 6 tabs. (NACA TN 2564)

**A STUDY OF ELASTIC AND PLASTIC STRESS CONCENTRATION FACTORS DUE TO NOTCHES AND FILLETS IN FLAT PLATES.** Herbert F. Hardrath and Lachlan Ohman. December 1951. 23p. diags. (NACA TN 2566)

**A STUDY OF POISSON'S RATIO IN THE YIELD REGION.** George Gerard and Sorrel Wildhorn, New York University. January 1952. 30p. diags., photos. (NACA TN 2561)

**EFFECT OF OPEN CIRCULAR HOLES ON TENSILE STRENGTH AND ELONGATION OF SHEET SPECIMENS OF A MAGNESIUM ALLOY.** R. S. Barker, Aluminum Company of America. June 1952. 24p. diags., 6 tabs. (NACA TN 2716)

**PLASTIC STRESS-STRAIN RELATIONS FOR COMBINED TENSION AND COMPRESSION.** Joseph Marin and H. A. B. Wiseman, Pennsylvania State College. July 1952. 61p. diags., photos., 2 tabs. (NACA TN 2737)

**STRESS AND STRAIN AT ONSET OF CRAZING OF POLYMETHYL METHACRYLATE AT VARIOUS TEMPERATURES.** M. A. Sherman and B. M. Axilrod, National Bureau of Standards. September 1952. 21p. diags., photos., 3 tabs. (NACA TN 2778)

**CORRELATION OF TENSILE STRENGTH, TENSILE DUCTILITY, AND NOTCH TENSILE STRENGTH WITH THE STRENGTH OF ROTATING DISKS OF SEVERAL DESIGNS IN THE RANGE OF LOW AND INTERMEDIATE DUCTILITY.** Arthur G. Holms and Andrew J. Repko. September 1952. 30p. diags., 3 tabs. (NACA TN 2791)

*Tensile (Cont.)*

EFFECTS OF MODERATE BIAxIAL STRETCH-FORMING ON TENSILE AND CRAZING PROPERTIES OF ACRYLIC PLASTIC GLAZING. B. M. Axilrod, M. A. Sherman, V. Cohen and I. Wolock, National Bureau of Standards. October 1952. 42p. photos., diagrs., 4 tabs. (NACA TN 2779)

A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE INFLUENCE OF TEMPERATURE GRADIENTS ON THE DEFORMATION AND BURST SPEEDS OF ROTATING DISKS. P. I. Wilterdink, A. G. Holms and S. S. Manson. October 1952. 45p. diagrs., photo., 2 tabs. (NACA TN 2803)

INFLUENCE OF NONMARTENSITIC TRANSFORMATION PRODUCTS ON MECHANICAL PROPERTIES OF TEMPERED MARTENSITE. J. M. Hodge and W. T. Lankford, United States Steel Company. December 1952. 13p. diagrs., 4 tabs. (NACA TN 2862)

A LINEAR TIME-TEMPERATURE RELATION FOR EXTRAPOLATION OF CREEP AND STRESS-RUPTURE DATA. S. S. Manson and A. M. Haferd. March 1953. 49p. diagrs. (NACA TN 2890)

EFFECT OF PROCESSING VARIABLES ON THE TRANSITION TEMPERATURE, STRENGTH, AND DUCTILITY OF HIGH-PURITY, SINTERED, WROUGHT MOLYBDENUM METAL. Kenneth C. Dike and Roger A. Long. March 1953. 26p. diagrs., photos., 3 tabs. (NACA TN 2915)

EFFECTS OF HIGH DEGREES OF BIAxIAL STRETCH-FORMING ON CRAZING AND OTHER PROPERTIES OF ACRYLIC PLASTIC GLAZING. I. Wolock, B. M. Axilrod and M. A. Sherman. National Bureau of Standards. May 1953. 18p. photos., diagrs., 3 tabs. (NACA RM 53D14)

**COMPRESSIVE**  
**(5.2.2)**

OBSERVATIONS ON BAUSCHINGER EFFECT IN COPPER AND BRASS. H. Schwartzbart, M. H. Jones and W. F. Brown, Jr. June 19, 1951. 37p. diagrs., photo. (NACA RM E51D13)

PROPERTIES OF HONEYCOMB CORES AS AFFECTED BY FIBER TYPE, FIBER ORIENTATION, RESIN TYPE, AND AMOUNT. R. J. Seidl, D. J. Fahey and A. W. Voss, Forest Products Laboratory. November 1951. 36p. diagrs., photos., 6 tabs. (NACA TN 2564)

A STUDY OF POISSON'S RATIO IN THE YIELD REGION. George Gerard and Sorrel Wildhorn, New York University. January 1952. 30p. diagrs., photos. (NACA TN 2561)

PLASTIC STRESS-STRAIN RELATIONS FOR COMBINED TENSION AND COMPRESSION. Joseph Marin and H. A. B. Wiseman, Pennsylvania State College. July 1952. 61p. diagrs., photos., 2 tabs. (NACA TN 2737)

**CREEP**  
**(5.2.3)**

INFLUENCE OF CHEMICAL COMPOSITION ON RUPTURE PROPERTIES AT 1200° F OF FORGED CHROMIUM-COBALT-NICKEL-IRON BASE ALLOYS IN SOLUTION-TREATED AND AGED CONDITION. E. E. Reynolds, J. W. Freeman and A. E. White, University of Michigan. 1951. ii, 60p. diagrs., photos., 11 tabs. (NACA Rept. 1058. Formerly TN 2449)

FUNDAMENTAL AGING EFFECTS INFLUENCING HIGH-TEMPERATURE PROPERTIES OF SOLUTION-TREATED INCONEL X. D. N. Frey, J. W. Freeman and A. E. White, University of Michigan. June 1951. 70p. diagrs., photos., 6 tabs. (NACA TN 2385)

A CRITICAL REVIEW OF NOTCH SENSITIVITY IN STRESS-RUPTURE TESTS. W. F. Brown, Jr. and George Sachs. August 1951. 29p. diagrs. (NACA TN 2433)

RUPTURE PROPERTIES OF LOW-CARBON N-155 TYPE ALLOYS MADE WITH A COLUMBIUM-TANTALUM FERRO-ALLOY. J. W. Freeman, E. E. Reynolds and A. E. White, University of Michigan. October 1951. 11p. diagrs., 2 tabs. (NACA TN 2469)

FUNDAMENTAL EFFECTS OF COLD-WORKING ON CREEP PROPERTIES OF LOW-CARBON N-155 ALLOY. D. N. Frey, J. W. Freeman and A. E. White, University of Michigan. October 1951. 45p. diagrs., photos. (NACA TN 2472)

A SURVEY OF CREEP IN METALS. A. D. Schwoppe and L. R. Jackson, Battelle Memorial Institute. November 1951. 66p. diagrs., tab. (NACA TN 2516)

FUNDAMENTAL EFFECTS OF COLD-WORK ON SOME COBALT-CHROMIUM-NICKEL-IRON BASE CREEP-RESISTANT ALLOYS. D. N. Frey, J. W. Freeman and A. E. White, University of Michigan. January 1952. 12p. diagrs. (NACA TN 2586)

CREEP IN METALS. A. D. Schwoppe, F. R. Shober and L. R. Jackson, Battelle Memorial Institute. February 1952. 52p. diagrs., photos., tab. (NACA TN 2618)

INFLUENCE OF CHEMICAL COMPOSITION ON RUPTURE TEST PROPERTIES AT 1500° F OF FORGED CHROMIUM-COBALT-NICKEL-IRON BASE ALLOYS. J. W. Freeman, J. F. Ewing and A. E. White, University of Michigan. July 1952. 69p. diagrs., photos., 2 tabs. (NACA TN 2745)

PREVIEW OF BEHAVIOR OF GRAIN BOUNDARIES IN CREEP OF ALUMINUM BICRYSTALS. F. N. Rhines and A. W. Cochardt, Carnegie Institute of Technology. July 1952. 40p. diagrs., photos. (NACA TN 2746)

A LINEAR TIME-TEMPERATURE RELATION FOR EXTRAPOLATION OF CREEP AND STRESS-RUPTURE DATA. S. S. Manson and A. M. Haferd. March 1953. 49p. diagrs. (NACA TN 2890)

*Creep (Cont.)*

SOME PROBLEMS OF THE THEORY OF CREEP. (Nekotorye Voprosy Teorii Polzuchesti). Y. N. Rabotnov. April 1953. 19p. diags. (NACA TM 1353. Trans. from Vestnik Moskovskovo Universiteta, no. 10, 1948, p.81-91).

THE CREEP OF SINGLE CRYSTALS OF ALUMINUM. R. D. Johnson, F. R. Shober and A. D. Schwabe, Battelle Memorial Institute. May 1953. 51p. diags., photos., tab. (NACA TN 2945)

**STRESS-RUPTURE**  
**(5.2.4)**

INFLUENCE OF CHEMICAL COMPOSITION ON RUPTURE PROPERTIES AT 1200° F OF FORGED CHROMIUM-COBALT-NICKEL-IRON BASE ALLOYS IN SOLUTION-TREATED AND AGED CONDITION. E. E. Reynolds, J. W. Freeman and A. E. White, University of Michigan. 1951. ii, 60p. diags., photos., 11 tabs. (NACA Rept. 1058. Formerly TN 2449)

FUNDAMENTAL AGING EFFECTS INFLUENCING HIGH-TEMPERATURE PROPERTIES OF SOLUTION-TREATED INCONEL X. D. N. Frey, J. W. Freeman and A. E. White, University of Michigan. June 1951. 70p. diags., photos., 6 tabs. (NACA TN 2385)

A CRITICAL REVIEW OF NOTCH SENSITIVITY IN STRESS-RUPTURE TESTS. W. F. Brown, Jr. and George Sachs. August 1951. 29p. diags. (NACA TN 2433)

INVESTIGATION OF TORSION CREEP-TO-RUPTURE PROPERTIES OF N-155 ALLOY. C. W. MacGregor and F. J. Walcott, Jr., Massachusetts Institute of Technology. August 1951. 26p. diags., photos., 4 tabs. (NACA RM 51E04)

RUPTURE PROPERTIES OF LOW-CARBON N-155 TYPE ALLOYS MADE WITH A COLUMBIUM-TANTALUM FERRO-ALLOY. J. W. Freeman, E. E. Reynolds and A. E. White, University of Michigan. October 1951. 11p. diags., 2 tabs. (NACA TN 2469)

FUNDAMENTAL EFFECTS OF COLD-WORK ON SOME COBALT-CHROMIUM-NICKEL-IRON BASE CREEP-RESISTANT ALLOYS. D. N. Frey, J. W. Freeman and A. E. White, University of Michigan. January 1952. 12p. diags. (NACA TN 2586)

INFLUENCE OF CHEMICAL COMPOSITION ON RUPTURE TEST PROPERTIES AT 1500° F OF FORGED CHROMIUM-COBALT-NICKEL-IRON BASE ALLOYS. J. W. Freeman, J. F. Ewing and A. E. White, University of Michigan. July 1952. 69p. diags., photos., 2 tabs. (NACA TN 2745)

A LINEAR TIME-TEMPERATURE RELATION FOR EXTRAPOLATION OF CREEP AND STRESS-RUPTURE DATA. S. S. Manson and A. M. Haferd. March 1953. 49p. diags. (NACA TN 2890)

**FATIGUE**  
**(5.2.5)**

FATIGUE STRENGTHS OF AIRCRAFT MATERIALS. AXIAL-LOAD FATIGUE TESTS ON NOTCHED SHEET SPECIMENS OF 24S-T3 AND 75S-T6 ALUMINUM ALLOYS AND OF SAE 4130 STEEL WITH STRESS-CONCENTRATION FACTORS OF 2.0 AND 4.0. H. J. Grover, S. M. Bishop and L. R. Jackson, Battelle Memorial Institute. June 1951. 64p. diags., 14 tabs., photos. (NACA TN 2389)

FATIGUE STRENGTHS OF AIRCRAFT MATERIALS. AXIAL-LOAD FATIGUE TESTS ON NOTCHED SHEET SPECIMENS OF 24S-T3 AND 75S-T6 ALUMINUM ALLOYS AND OF SAE 4130 STEEL WITH STRESS-CONCENTRATION FACTOR OF 5.0. H. J. Grover, S. M. Bishop and L. R. Jackson, Battelle Memorial Institute. June 1951. 19p. diags., 8 tabs. (NACA TN 2390)

EFFECT OF SURFACE FINISH ON FATIGUE PROPERTIES AT ELEVATED TEMPERATURES. I - LOW-CARBON N-155 WITH GRAIN SIZE OF A.S.T.M. 1. Robert R. Ferguson. June 26, 1951. 18p. diags., photos., 2 tabs. (NACA RM E51D17)

EFFECTS OF DESIGN DETAILS ON THE FATIGUE STRENGTH OF 355-T6 SAND-CAST ALUMINUM ALLOY. M. Holt and I. D. Eaton, Aluminum Company of America. July 1951. 45p. diags., photos., 5 tabs. (NACA TN 2394)

INVESTIGATION OF THE FATIGUE STRENGTH OF FULL-SCALE AIRPLANE WING STRUCTURES. Dwight O. Fearnow. July 1951. 30p. diags., photos., 3 tabs. (NACA RM L51D13a)

INVESTIGATION OF THE STRUCTURAL DAMPING OF A FULL-SCALE AIRPLANE WING. Dwight O. Fearnow. February 1952. 11p. diags., photo., tab. (NACA TN 2594. Formerly RM L51A04)

FATIGUE STRENGTHS OF AIRCRAFT MATERIALS. AXIAL-LOAD FATIGUE TESTS ON NOTCHED SHEET SPECIMENS OF 24S-T3 AND 75S-T6 ALUMINUM ALLOYS AND OF SAE 4130 STEEL WITH STRESS-CONCENTRATION FACTOR OF 1.5. H. J. Grover, W. S. Hyler and L. R. Jackson, Battelle Memorial Institute. February 1952. 22p. diags., 9 tabs. (NACA TN 2639)

FATIGUE STRENGTHS OF 14S-T4 ALUMINUM ALLOY SUBJECTED TO BIAXIAL TENSILE STRESSES. Joseph Marin and W. P. Hughes, Pennsylvania State College. June 1952. 24p. photos., diags., 5 tabs. (NACA TN 2704)

FATIGUE AND STATIC TESTS OF FLUSH-RIVETED JOINTS. Darnley M. Howard and Frank C. Smith, National Bureau of Standards. June 1952. 38p. photos., diags., 3 tabs. (NACA TN 2709)

INVESTIGATION OF STATISTICAL NATURE OF FATIGUE PROPERTIES. E. Epremian and R. F. Mehl, Carnegie Institute of Technology. June 1952. ii, 119p. diags., photos., tab. (NACA TN 2719)



*Fatigue (Cont.)*

AN EXPERIMENTAL INVESTIGATION OF THE BEHAVIOR OF 24S-T4 ALUMINUM ALLOY SUBJECTED TO REPEATED STRESSES OF CONSTANT AND VARYING AMPLITUDES. Herbert F. Hardrath and Elmer C. Utley, Jr. October 1952. 23p. diagrs., 4 tabs. (NACA TN 2798)

AN ENGINEERING METHOD FOR ESTIMATING NOTCH-SIZE EFFECT IN FATIGUE TESTS ON STEEL. Paul Kuhn and Herbert F. Hardrath. October 1952. 35p. diagrs., 7 tabs. (NACA TN 2805)

EFFECTS OF CYCLIC LOADING ON MECHANICAL BEHAVIOR OF 24S-T4 AND 75S-T6 ALUMINUM ALLOYS AND SAE 4130 STEEL. C. W. MacGregor and N. Grossman. Massachusetts Institute of Technology. October 1952. 53p. diagrs., photos., 4 tabs. (NACA TN 2812)

INFLUENCE OF NONMARTENSITIC TRANSFORMATION PRODUCTS ON MECHANICAL PROPERTIES OF TEMPERED MARTENSITE. J. M. Hodge and W. T. Lankford, United States Steel Company. December 1952. 13p. diagrs., 4 tabs. (NACA TN 2862)

INTERIM REPORT ON A FATIGUE INVESTIGATION OF A FULL-SCALE TRANSPORT AIRCRAFT WING STRUCTURE. M. James McGuigan, Jr. April 1953. 36p. photos., diagrs., 2 tabs. (NACA TN 2920)

COMBINED-STRESS FATIGUE STRENGTH OF 76S-T61 ALUMINUM ALLOY WITH SUPERIMPOSED MEAN STRESSES AND CORRECTIONS FOR YIELDING. William N. Findley, University of Illinois. May 1953. 90p. diagrs., photos., 3 tabs. (NACA TN 2924)

AXIAL-LOAD FATIGUE PROPERTIES OF 24S-T AND 75S-T ALUMINUM ALLOY AS DETERMINED IN SEVERAL LABORATORIES. H. J. Grover and W. S. Hyler, Battelle Memorial Institute, Paul Kuhn and Charles B. Landers, Langley Aeronautical Laboratory and F. M. Howell, Aluminum Company of America. May 1953. 63p. photos., diagrs., 7 tabs. (NACA TN 2928)

## SHEAR (5.2.6)

PROPERTIES OF HONEYCOMB CORES AS AFFECTED BY FIBER TYPE, FIBER ORIENTATION, RESIN TYPE, AND AMOUNT. R. J. Seidl, D. J. Fahey and A. W. Voss, Forest Products Laboratory. November 1951. 36p. diagrs., photos., 6 tabs. (NACA TN 2564)

EFFECT OF TEMPERATURES FROM -70° TO 600° F ON STRENGTH OF ADHESIVE-BONDED LAP SHEAR SPECIMENS OF CLAD 24S-T3 ALUMINUM ALLOY AND OF COTTON- AND GLASS-FABRIC PLASTIC LAMINATES. H. W. Eickner, W. Z. Olson and R. F. Blomquist, Forest Products Laboratory. June 1952. 26p. diagrs., 6 tabs. (NACA TN 2717)

PREVIEW OF BEHAVIOR OF GRAIN BOUNDARIES IN CREEP OF ALUMINUM BICRYSTALS. F. N. Rhines and A. W. Cochardt, Carnegie Institute of Technology. July 1952. 40p. diagrs., photos. (NACA TN 2746)

COMBINED-STRESS FATIGUE STRENGTH OF 76S-T61 ALUMINUM ALLOY WITH SUPERIMPOSED MEAN STRESSES AND CORRECTIONS FOR YIELDING. William N. Findley, University of Illinois. May 1953. 90p. diagrs., photos., 3 tabs. (NACA TN 2924)

## FLEXURAL (5.2.7)

EFFECT OF FUEL IMMERSION ON LAMINATED PLASTICS. W. A. Crouse, Margie Carickhoff and Margaret A. Fisher, National Bureau of Standards. June 1951. 34p. diagrs., photos., 9 tabs. (NACA TN 2377)

A FUNDAMENTAL STUDY OF THE MECHANISM BY WHICH HYDROGEN ENTERS METALS DURING CHEMICAL AND ELECTROCHEMICAL PROCESSING. L. D. McGraw, C. A. Snavey, H. L. Moore, P. T. Woodberry and C. L. Faust, Battelle Memorial Institute. April 1952. ii, 43p. photos., diagr., 6 tabs. (NACA TN 2696)

COMBINED-STRESS FATIGUE STRENGTH OF 76S-T61 ALUMINUM ALLOY WITH SUPERIMPOSED MEAN STRESSES AND CORRECTIONS FOR YIELDING. William N. Findley, University of Illinois. May 1953. 90p. diagrs., photos., 3 tabs. (NACA TN 2924)

## CORROSION RESISTANCE (5.2.8)

PRELIMINARY INVESTIGATION OF HYDRAZINE AS A ROCKET FUEL. Paul M. Ordín, Riley O. Miller and John M. Diehl. May 24, 1948. 35p. diagrs., photos. (NACA RM E7H21) (Declassified from Confidential, 9/16/52)

INVESTIGATION OF FRETTING BY MICROSCOPIC OBSERVATION. Douglas Godfrey. 1951. ii, 10p. photos. (NACA Rept. 1009. Formerly TN 2039)

EFFECTIVENESS OF CERAMIC COATINGS IN REDUCING CORROSION OF FIVE HEAT-RESISTANT ALLOYS BY LEAD-BROMIDE VAPORS. Dwight G. Moore and Mary W. Mason, National Bureau of Standards. June 1951. 24p. diagrs., photos., 4 tabs. (NACA TN 2380)

STUDIES OF HIGH-TEMPERATURE PROTECTION OF A TITANIUM-CARBIDE CERAMAL BY CHROMIUM-TYPE CERAMIC-METAL COATINGS. Dwight G. Moore, Stanley G. Benner and William N. Harrison, National Bureau of Standards. June 1951. 24p. diagrs., photos., 8 tabs. (NACA TN 2386)

ROTOGENERATIVE DETECTION OF CORROSION CURRENTS. Joseph B. McAndrew, William H. Colner and Howard T. Francis, Armour Research Foundation. November 1951. 12p. photos., diagrs. (NACA TN 2523)

*Corrosion Resistance (Cont.)*

MECHANICAL AND CORROSION TESTS OF SPOT-WELDED ALUMINUM ALLOYS. Fred M. Reinhart, National Bureau of Standards, and W. F. Hess, R. A. Wyant, F. J. Winsor and R. R. Nash, Rensselaer Polytechnic Institute. December 1951. 74p. diagrs., photos., 19 tabs. (NACA TN 2538)

CERAMIC COATINGS FOR PREVENTION OF CARBON ABSORPTION IN FOUR HEAT-RESISTANT ALLOYS. Joseph W. Pitts and Dwight G. Moore, National Bureau of Standards. December 1951. 14p. diagr., photos., 3 tabs. (NACA TN 2572)

RELATIVE IMPORTANCE OF VARIOUS SOURCES OF DEFECT-PRODUCING HYDROGEN INTRODUCED INTO STEEL DURING APPLICATION OF VITREOUS COATINGS. Dwight G. Moore, Mary A. Mason and William N. Harrison, National Bureau of Standards. February 1952. 31p. photos., diagrs., 5 tabs. (NACA TN 2617)

CORROSION OF MAGNESIUM ALLOY ZK60A IN MARINE ATMOSPHERE AND TIDEWATER. Fred M. Reinhart, National Bureau of Standards. February 1952. 10p. photos., 4 tabs. (NACA TN 2632)

MIGRATION OF COBALT DURING FIRING OF GROUND-COAT ENAMELS ON IRON. William N. Harrison, Joseph C. Richmond, Joseph W. Pitts and Stanley G. Benner, National Bureau of Standards. June 1952. 28p. photos., 5 tabs. (NACA TN 2695)

THE OXIDATION OF METALS AND ALLOYS. (Über das Zundern von Metalle und Legierungen). Erich Scheil. June 1952. 16p. diagrs., photos. (NACA TM 1338. Trans. from Zeitschrift für Metallkunde, v. 29, July 1937, p. 209-214).

VELOCITY OF ACTION OF OXYGEN, HYDROGEN SULFIDE, AND HALOGENS ON METALS. (Die Geschwindigkeit der Einwirkung von Sauerstoff, Schwefelwasserstoff, und Halogenen auf Metalle). G. Tammann and W. Köster. June 1952. 21p. diagrs., 20 tabs. (NACA TM 1339. Trans. from Zeitschrift für anorganische und allgemeine Chemie, v. 123, August 1922, p. 196-201 and 208-224).

INVESTIGATION OF GASES EVOLVED DURING FIRING OF VITREOUS COATINGS ON STEEL. Dwight G. Moore and Mary A. Mason, National Bureau of Standards. January 1953. 34p. diagrs., photos., 7 tabs. (NACA TN 2865)

## STRUCTURE (5.2.9)

FUNDAMENTAL EFFECTS OF AGING ON CREEP PROPERTIES OF SOLUTION-TREATED LOW-CARBON N-155 ALLOY. D. N. Frey, J. W. Freeman and A. E. White, University of Michigan. 1950. ii, 30p. diagrs., photos., 5 tabs. (NACA Rept. 1001. Formerly TN 1940)

INFLUENCE OF CHEMICAL COMPOSITION ON RUPTURE PROPERTIES AT 1200° F OF FORGED CHROMIUM-COBALT-NICKEL-IRON BASE ALLOYS IN SOLUTION-TREATED AND AGED CONDITION. E. E. Reynolds, J. W. Freeman and A. E. White, University of Michigan. 1951. ii, 60p. diagrs., photos., 11 tabs. (NACA Rept. 1058. Formerly TN 2449)

FUNDAMENTAL AGING EFFECTS INFLUENCING HIGH-TEMPERATURE PROPERTIES OF SOLUTION-TREATED INCONEL X. D. N. Frey, J. W. Freeman and A. E. White, University of Michigan. June 1951. 70p. diagrs., photos., 6 tabs. (NACA TN 2385)

RESOLUTION OF ANNEALING EXPERIMENTS FOR THE STUDY OF NONEQUILIBRIUM STATES. Philip Schwed. September 1951. 15p. diagrs. (NACA RM E51G24)

FUNDAMENTAL EFFECTS OF COLD-WORKING ON CREEP PROPERTIES OF LOW-CARBON N-155 ALLOY. D. N. Frey, J. W. Freeman and A. E. White, University of Michigan. October 1951. 45p. diagrs., photos. (NACA TN 2472)

RELATIONS BETWEEN THE MODULUS OF ELASTICITY OF BINARY ALLOYS AND THEIR STRUCTURE. (Beziehungen zwischen dem Elastizitätsmodul von Zweistofflegierungen und ihrem Aufbau). Werner Köster and Walter Rauscher. November 1951. 49p. diagrs. (NACA TM 1321. Trans. from Zeitschrift für Metallkunde, v. 39, 1948, p. 111-120. Dissertation Technische Hochschule Stuttgart, 1942).

FUNDAMENTAL EFFECTS OF COLD-WORK ON SOME COBALT-CHROMIUM-NICKEL-IRON BASE CREEP-RESISTANT ALLOYS. D. N. Frey, J. W. Freeman and A. E. White, University of Michigan. January 1952. 12p. diagrs. (NACA TN 2586)

SURVEY OF THE CHROMIUM-COBALT-NICKEL PHASE DIAGRAM AT 1200° C. W. D. Manly and Paul A. Beck, University of Notre Dame. February 1952. 45p. diagrs., photos., 9 tabs. (NACA TN 2602)

SURVEY OF PORTIONS OF THE COBALT-CHROMIUM-IRON-NICKEL QUATERNARY SYSTEM. E. L. Kamen and Paul A. Beck. February 1952. 62p. photos., diagrs., 13 tabs. (NACA TN 2603)

ABNORMAL GRAIN GROWTH IN S-816 ALLOY. A. I. Rush, J. W. Freeman and A. E. White, University of Michigan. April 1952. 30p. photos., diagrs., tab. (NACA TN 2678)

SURVEY OF PORTIONS OF THE CHROMIUM-COBALT-NICKEL-MOLYBDENUM QUATERNARY SYSTEM AT 1200° C. Sheldon Paul Rideout and Paul A. Beck, University of Notre Dame. April 1952. 81p. diagrs., photos., 20 tabs. (NACA TN 2683)

VELOCITY OF ACTION OF OXYGEN, HYDROGEN SULFIDE, AND HALOGENS ON METALS. (Die Geschwindigkeit der Einwirkung von Sauerstoff, Schwefelwasserstoff, und Halogenen auf Metalle). G. Tammann and W. Köster. June 1952. 21p. diagrs., 20 tabs. (NACA TM 1339. Trans. from Zeitschrift für anorganische und allgemeine Chemie, v. 123, August 1922, p. 196-201 and 208-224).

INFLUENCE OF CHEMICAL COMPOSITION ON RUPTURE TEST PROPERTIES AT 1500° F OF FORGED CHROMIUM-COBALT-NICKEL-IRON BASE ALLOYS. J. W. Freeman, J. F. Ewing and A. E. White, University of Michigan. July 1952. 69p. diagrs., photos., 2 tabs. (NACA TN 2745)

PREVIEW OF BEHAVIOR OF GRAIN BOUNDARIES IN CREEP OF ALUMINUM BICRYSTALS. F. N. Rhines and A. W. Cochardt, Carnegie Institute of Technology. July 1952. 40p. diagrs., photos. (NACA TN 2746)

*Structure (Cont.)*

SURVEY OF PORTIONS OF THE IRON-NICKEL-MOLYBDENUM AND COBALT-IRON-MOLYBDENUM TERNARY SYSTEMS AT 1200° C. Dilip K. Das and Paul A. Beck, University of Notre Dame. February 1953. 56p. diagrs., photos., 15 tabs. (NACA TN 2896)

EFFECT OF PROCESSING VARIABLES ON THE TRANSITION TEMPERATURE, STRENGTH, AND DUCTILITY OF HIGH-PURITY, SINTERED, WROUGHT MOLYBDENUM METAL. Kenneth C. Dike and Roger A. Long. March 1953. 26p. diagrs., photos., 3 tabs. (NACA TN 2915)

## EFFECTS OF NUCLEAR RADIATION (5.2.10)

IMPLICATION OF THE TRANSPORT EQUATION FOR THE SEMIEMPIRICAL TREATMENT OF SHIELDS. Philip Schwed. March 1952. 31p. (NACA TN 2647)

## THERMAL (5.2.11)

SURVEY OF THE CHROMIUM-COBALT-NICKEL PHASE DIAGRAM AT 1200° C. W. D. Manly and Paul A. Beck, University of Notre Dame. February 1952. 45p. diagrs., photos., 9 tabs. (NACA TN 2602)

SURVEY OF PORTIONS OF THE COBALT-CHROMIUM-IRON-NICKEL QUATERNARY SYSTEM. E. L. Kamen and Paul A. Beck. February 1952. 62p. photos., diagrs., 13 tabs. (NACA TN 2603)

SURVEY OF PORTIONS OF THE CHROMIUM-COBALT-NICKEL-MOLYBDENUM QUATERNARY SYSTEM AT 1200° C. Sheldon Paul Rideout and Paul A. Beck, University of Notre Dame. April 1952. 81p. diagrs., photos., 20 tabs. (NACA TN 2683)

SURVEY OF PORTIONS OF THE IRON-NICKEL-MOLYBDENUM AND COBALT-IRON-MOLYBDENUM TERNARY SYSTEMS AT 1200° C. Dilip K. Das and Paul A. Beck, University of Notre Dame. February 1953. 56p. diagrs., photos., 15 tabs. (NACA TN 2896)

THE CREEP OF SINGLE CRYSTALS OF ALUMINUM. R. D. Johnson, F. R. Shober and A. D. Schwoppe, Battelle Memorial Institute. May 1953. 51p. diagrs., photos., tab. (NACA TN 2945)

## MULTIAXIAL STRESS (5.2.12)

ANALYSIS OF PLANE-PLASTIC-STRESS PROBLEMS WITH AXIAL SYMMETRY IN STRAIN-HARDENING RANGE. M. H. Lee Wu. 1951. ii, 23p. diagrs. (NACA Rept. 1021. Formerly NACA TN 2217)

PLASTIC STRESS-STRAIN RELATIONS FOR 75S-T6 ALUMINUM ALLOY SUBJECTED TO BI-AXIAL TENSILE STRESSES. Joseph Marin, B. H. Ulrich and W. P. Hughes, Pennsylvania State College. August 1951. 48p. diagrs., photos., 5 tabs. (NACA TN 2425)

A CRITICAL REVIEW OF NOTCH SENSITIVITY IN STRESS-RUPTURE TESTS. W. F. Brown, Jr. and George Sachs. August 1951. 29p. diagrs. (NACA TN 2433)

INVESTIGATION OF TORSION CREEP-TO-RUPTURE PROPERTIES OF N-155 ALLOY. C. W. MacGregor and F. J. Walcott, Jr., Massachusetts Institute of Technology. August 1951. 26p. diagrs., photos., 4 tabs. (NACA RM 51E04)

FATIGUE STRENGTHS OF 14S-T4 ALUMINUM ALLOY SUBJECTED TO BIAXIAL TENSILE STRESSES. Joseph Marin and W. P. Hughes, Pennsylvania State College. June 1952. 24p. photos., diagrs., 5 tabs. (NACA TN 2704)

PLASTIC STRESS-STRAIN RELATIONS FOR COMBINED TENSION AND COMPRESSION. Joseph Marin and H. A. B. Wiseman, Pennsylvania State College. July 1952. 61p. diagrs., photos., 2 tabs. (NACA TN 2737)

PREVIEW OF BEHAVIOR OF GRAIN BOUNDARIES IN CREEP OF ALUMINUM BICRYSTALS. F. N. Rhines and A. W. Cochardt, Carnegie Institute of Technology. July 1952. 40p. diagrs., photos. (NACA TN 2746)

A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE INFLUENCE OF TEMPERATURE GRADIENTS ON THE DEFORMATION AND BURST SPEEDS OF ROTATING DISKS. P. I. Wilterdink, A. G. Holms and S. S. Manson. October 1952. 45p. diagrs., photo., 2 tabs. (NACA TN 2803)

COMBINED-STRESS FATIGUE STRENGTH OF 76S-T61 ALUMINUM ALLOY WITH SUPERIMPOSED MEAN STRESSES AND CORRECTIONS FOR YIELDING. William N. Findley, University of Illinois. May 1953. 90p. diagrs., photos., 3 tabs. (NACA TN 2924)

## PLASTICITY (5.2.13)

ANALYSIS OF PLANE-PLASTIC-STRESS PROBLEMS WITH AXIAL SYMMETRY IN STRAIN-HARDENING RANGE. M. H. Lee Wu. 1951. ii, 23p. diagrs. (NACA Rept. 1021. Formerly NACA TN 2217)

INFLUENCE OF TENSILE STRENGTH AND DUCTILITY ON STRENGTHS OF ROTATING DISKS IN PRESENCE OF MATERIAL AND FABRICATION DEFECTS OF SEVERAL TYPES. Arthur G. Holms, Joseph E. Jenkins and Andrew J. Repko. June 1951. 39p. diagrs., photos., tab. (NACA TN 2397)

OBSERVATIONS ON BAUSCHINGER EFFECT IN COPPER AND BRASS. H. Schwartzbart, M. H. Jones and W. F. Brown, Jr. June 19, 1951. 37p. diagrs., photo. (NACA RM E51D13)

**MATERIALS**  
**170 PROPERTIES (5.2)**

*Plasticity (Cont.)*

**PLASTIC STRESS-STRAIN RELATIONS FOR 75S-T6 ALUMINUM ALLOY SUBJECTED TO BI-AXIAL TENSILE STRESSES.** Joseph Marin, B. H. Ulrich and W. P. Hughes, Pennsylvania State College. August 1951. 48p. diagrs., photos., 5 tabs. (NACA TN 2425)

**A THEORY OF CONDUCTIVITY OF COLD-WORKED COPPER.** Rolf Landauer. September 1951. 23p. diagrs. (NACA TN 2439)

**EFFECTIVE MODULUS IN PLASTIC BUCKLING OF HIGH-STRENGTH ALUMINUM-ALLOY SHEET.** James A. Miller and Pearl V. Jacobs, National Bureau of Standards. September 1951. 15p. diagrs., 2 tabs. (NACA RM 51G11)

**A STUDY OF ELASTIC AND PLASTIC STRESS CONCENTRATION FACTORS DUE TO NOTCHES AND FILLETS IN FLAT PLATES.** Herbert F. Hardrath and Lachlan Ohman. December 1951. 23p. diagrs. (NACA TN 2566)

**A STUDY OF SLIP FORMATION IN POLYCRYSTALLINE ALUMINUM.** Aldie E. Johnson, Jr. and S. B. Batdorf. December 1951. 18p. photos., diagr., tab. (NACA TN 2576)

**ON THE ANGULAR DISTRIBUTION OF SLIP LINES IN POLYCRYSTALLINE ALUMINUM ALLOY.** John M. Hedgepeth, S. B. Batdorf and J. Lyell Sanders, Jr. December 1951. 18p. photos., diagrs., tab. (NACA TN 2577)

**INELASTIC COLUMN BEHAVIOR.** John E. Duberg and Thomas W. Wilder, III. 1952. iii, 16p. (NACA Rept. 1072. Formerly TN 2267)

**A STUDY OF POISSON'S RATIO IN THE YIELD REGION.** George Gerard and Sorrel Wildhorn, New York University. January 1952. 30p. diagrs., photos. (NACA TN 2561)

**ABNORMAL GRAIN GROWTH IN S-816 ALLOY.** A. I. Rush, J. W. Freeman and A. E. White, University of Michigan. April 1952. 30p. photos., diagrs., tab. (NACA TN 2678)

**PLASTIC STRESS-STRAIN RELATIONS FOR COMBINED TENSION AND COMPRESSION.** Joseph Marin and H. A. B. Wiseman, Pennsylvania State College. July 1952. 61p. diagrs., photos., 2 tabs. (NACA TN 2737)

**PREVIEW OF BEHAVIOR OF GRAIN BOUNDARIES IN CREEP OF ALUMINUM BICRYSTALS.** F. N. Rhines and A. W. Cochardt, Carnegie Institute of Technology. July 1952. 40p. diagrs., photos. (NACA TN 2746)

**THEORETICAL DISTRIBUTION OF SLIP ANGLES IN AN AGGREGATE OF FACE-CENTERED CUBIC CRYSTALS.** John M. Hedgepeth. August 1952. 32p. diagrs. (NACA TN 2777)

**CORRELATION OF TENSILE STRENGTH, TENSILE DUCTILITY, AND NOTCH TENSILE STRENGTH WITH THE STRENGTH OF ROTATING DISKS OF SEVERAL DESIGNS IN THE RANGE OF LOW AND INTERMEDIATE DUCTILITY.** Arthur G. Holms and Andrew J. Repko. September 1952. 30p. diagrs., 3 tabs. (NACA TN 2791)

**A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE INFLUENCE OF TEMPERATURE GRADIENTS ON THE DEFORMATION AND BURST SPEEDS OF ROTATING DISKS.** P. I. Wilterdink, A. G. Holms and S. S. Manson. October 1952. 45p. diagrs., photo., 2 tabs. (NACA TN 2803)

**THE EFFECT OF INITIAL CURVATURE ON THE STRENGTH OF AN INELASTIC COLUMN.** Thomas W. Wilder, III, William A. Brooks, Jr., and Eldon E. Mathauser. January 1953. 17p. diagrs. (NACA TN 2872)

**AN ANALYSIS OF STATICALLY INDETERMINATE TRUSSES HAVING MEMBERS STRESSED BEYOND THE PROPORTIONAL LIMIT.** Thomas W. Wilder, III. February 1953. 13p. diagrs., 4 tabs. (NACA TN 2886)

**A LINEAR TIME-TEMPERATURE RELATION FOR EXTRAPOLATION OF CREEP AND STRESS-RUPTURE DATA.** S. S. Manson and A. M. Haferd. March 1953. 49p. diagrs. (NACA TN 2890)

**THE CREEP OF SINGLE CRYSTALS OF ALUMINUM.** R. D. Johnson, F. R. Shober and A. D. Schwoppe, Battelle Memorial Institute. May 1953. 51p. diagrs., photos., tab. (NACA TN 2945)

## Operating Stresses and Conditions

### (5.3)

INFLUENCE OF TENSILE STRENGTH AND DUCTILITY ON STRENGTHS OF ROTATING DISKS IN PRESENCE OF MATERIAL AND FABRICATION DEFECTS OF SEVERAL TYPES. Arthur G. Holms, Joseph E. Jenkins and Andrew J. Repko. June 1951. 39p. diagrs., photos., tab. (NACA TN 2397)

CORRELATION OF TENSILE STRENGTH, TENSILE DUCTILITY, AND NOTCH TENSILE STRENGTH WITH THE STRENGTH OF ROTATING DISKS OF SEVERAL DESIGNS IN THE RANGE OF LOW AND INTERMEDIATE DUCTILITY. Arthur G. Holms and Andrew J. Repko. September 1952. 30p. diagrs., 3 tabs. (NACA TN 2791)

A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE INFLUENCE OF TEMPERATURE GRADIENTS ON THE DEFORMATION AND BURST SPEEDS OF ROTATING DISKS. P. I. Wilterdink, A. G. Holms and S. S. Manson. October 1952. 45p. diagrs., photo., 2 tabs. (NACA TN 2803)

THE AERODYNAMIC DESIGN OF SUPERSONIC PROPELLERS FROM STRUCTURAL CONSIDERATION. Jerome B. Hammack. December 1952. 21p. diagrs. (NACA TN 2851)

## AIRFRAME

### (5.3.1)

EFFECT OF STRESS-SOLVENT CRAZING ON TENSILE STRENGTH OF POLYMETHYL METHACRYLATE. B. M. Axilrod and Martha A. Sherman, National Bureau of Standards. August 1951. 19p. photos., 4 tabs. (NACA TN 2444)

## PROPULSION SYSTEM

### (5.3.2)

ANALYTICAL INVESTIGATION OF DISTRIBUTION OF CENTRIFUGAL STRESSES AND THEIR RELATION TO LIMITING OPERATING TEMPERATURES IN GAS-TURBINE BLADES. Richard H. Kemp and William C. Morgan. April 12, 1948. 25p. photo., diagrs. (NACA RM E7L05) (Declassified from Restricted, 6/11/53)

A BIHARMONIC RELAXATION METHOD FOR CALCULATING THERMAL STRESS IN COOLED IRREGULAR CYLINDERS. Arthur G. Holms. 1952. ii, 19p. diagrs., 4 tabs. (NACA Rept. 1059. Formerly TN 2434)



# METEOROLOGY

(6)

**AN INSTRUMENT EMPLOYING A CORONAL DISCHARGE FOR THE DETERMINATION OF DROPLET-SIZE DISTRIBUTION IN CLOUDS.** Rinaldo J. Brun, Joseph Levine, and Kenneth S. Kleinknecht. September 1951. 53p. diagrs., photos., 4 tabs. (NACA TN 2458)

**EXPERIMENTAL VALUES OF THE SURFACE TENSION OF SUPERCOOLED WATER.** Paul T. Hacker. October 1951. 20p. diagrs., photos., tab. (NACA TN 2510)

**A SUMMARY OF METEOROLOGICAL CONDITIONS ASSOCIATED WITH AIRCRAFT ICING AND A PROPOSED METHOD OF SELECTING DESIGN CRITERIONS FOR ICE-PROTECTION EQUIPMENT.** Paul T. Hacker and Robert G. Dorsch. November 1951. 35p. diagrs. (NACA TN 2569)

**A PHOTOGRAPHIC STUDY OF FREEZING OF WATER DROPLETS FALLING FREELY IN AIR.** Robert G. Dorsch and Joseph Levine. February 1952. 29p. diagrs., photos., 2 tabs. (NACA RM E51L17)

**A PROBABILITY ANALYSIS OF THE METEOROLOGICAL FACTORS CONDUCTIVE TO AIRCRAFT ICING IN THE UNITED STATES.** William Lewis and Norman R. Bergrun. June 1952. 93p. diagrs., 11 tabs. (NACA TN 2738)

**IMPINGEMENT OF CLOUD DROPLETS ON AERODYNAMIC BODIES AS AFFECTED BY COMPRESSIBILITY OF AIR FLOW AROUND THE BODY.** Rinaldo J. Brun, John S. Serafini and Helen M. Gallagher. March 1953. 20p. diagrs. (NACA TN 2903)

**A METHOD FOR DETERMINING CLOUD-DROPLET IMPINGEMENT ON SWEEPED WINGS.** Robert G. Dorsch and Rinaldo J. Brun. April 1953. 29p. diagrs. (NACA TN 2931)

# Atmosphere

## (6.1)

**AN INSTRUMENT EMPLOYING A CORONAL DISCHARGE FOR THE DETERMINATION OF DROPLET-SIZE DISTRIBUTION IN CLOUDS.** Rinaldo J. Brun, Joseph Levine, and Kenneth S. Kleinknecht. September 1951. 53p. diagrs., photos., 4 tabs. (NACA TN 2458)

**A PROBABILITY ANALYSIS OF THE METEOROLOGICAL FACTORS CONDUCTIVE TO AIRCRAFT ICING IN THE UNITED STATES.** William Lewis and Norman R. Bergrun. June 1952. 93p. diagrs., 11 tabs. (NACA TN 2738)

**MEASUREMENTS OF TEMPERATURE VARIATIONS IN THE ATMOSPHERE NEAR THE TROPOPAUSE WITH REFERENCE TO AIRSPEED CALIBRATION BY THE TEMPERATURE METHOD.** Lindsay J. Lina and Harry H. Ricker, Jr. October 1952. 23p. diagrs., tab. (NACA TN 2807)

**IMPINGEMENT OF CLOUD DROPLETS ON AERODYNAMIC BODIES AS AFFECTED BY COMPRESSIBILITY OF AIR FLOW AROUND THE BODY.** Rinaldo J. Brun, John S. Serafini and Helen M. Gallagher. March 1953. 20p. diagrs. (NACA TN 2903)

**IMPINGEMENT OF WATER DROPLETS ON A CYLINDER IN AN INCOMPRESSIBLE FLOW FIELD AND EVALUATION OF ROTATING MULTICYLINDER METHOD FOR MEASUREMENT OF DROPLET-SIZE DISTRIBUTION, VOLUME-MEDIAN DROPLET SIZE, AND LIQUID-WATER CONTENT IN CLOUDS.** Rinaldo J. Brun and Harry W. Mergler. March 1953. 71p. diagrs., photo., 4 tabs. (NACA TN 2904)

**A METHOD FOR DETERMINING CLOUD-DROPLET IMPINGEMENT ON SWEEP WINGS.** Robert G. Dorsch and Rinaldo J. Brun. April 1953. 29p. diagrs. (NACA TN 2931)

## GUSTS

### (6.1.2)

**SUMMARY OF INFORMATION RELATING TO GUST LOADS ON AIRPLANES.** Philip Donely. 1950. iii, 51p. diagrs., photos., 21 tabs. (NACA Rept. 997. Formerly TN 1976)

**FLIGHT INVESTIGATION OF THE EFFECT OF ATMOSPHERIC TURBULENCE ON THE CLIMB PERFORMANCE OF AN AIRPLANE.** Harry Press and Herbert C. McClanahan, Jr. October 1951. 30p. diagrs., 5 tabs. (NACA TN 2498)

**SUMMARY OF ACCELERATION AND AIRSPEED DATA FROM COMMERCIAL TRANSPORT AIRPLANES DURING THE PERIOD FROM 1933 TO 1945.** Walter G. Walker and Roy Steiner. February 1952. 30p. diagrs., 5 tabs. (NACA TN 2625)

**NORMAL ACCELERATIONS AND ASSOCIATED OPERATING CONDITIONS ON FOUR TYPES OF COMMERCIAL TRANSPORT AIRPLANES FROM VGH DATA AVAILABLE AS OF SEPTEMBER 1951.** Roy Steiner and Doris A. Persh. May 1952. 8p. diagrs., 5 tabs. (NACA RM L52A28)

**AN ANALYSIS OF THE NORMAL ACCELERATIONS AND AIRSPEEDS OF A TWO-ENGINE TYPE OF TRANSPORT AIRPLANE IN COMMERCIAL OPERATIONS ON ROUTES IN THE CENTRAL UNITED STATES FROM 1948 TO 1950.** Walter G. Walker and Paul W. J. Schumacher. July 1952. 30p. diagrs., 4 tabs. (NACA TN 2735)

**AN ANALYSIS OF NORMAL ACCELERATIONS AND AIRSPEEDS OF ONE TYPE OF TWIN-ENGINE TRANSPORT AIRPLANE IN COMMERCIAL OPERATIONS OVER A NORTHERN TRANSCONTINENTAL ROUTE.** Roy Steiner. November 1952. 23p. diagrs., 4 tabs. (NACA TN 2833)

**A STUDY OF THE APPLICATION OF POWER-SPECTRAL METHODS OF GENERALIZED HARMONIC ANALYSIS TO GUST LOADS ON AIRPLANES.** Harry Press and Bernard Mazelsky. January 1953. 48p. diagrs., 2 tabs. (NACA TN 2853)

## STRUCTURE

### (6.1.2.1)

**A RELATION OF WIND SHEAR AND INSOLATION TO THE TURBULENCE ENCOUNTERED BY AN AIRPLANE IN CLEAR-AIR FLIGHT AT LOW ALTITUDES.** James K. Thompson. September 1951. 12p. diagrs., tab. (NACA RM L51H07)

## FREQUENCY

### (6.1.2.2)

**A RELATION OF WIND SHEAR AND INSOLATION TO THE TURBULENCE ENCOUNTERED BY AN AIRPLANE IN CLEAR-AIR FLIGHT AT LOW ALTITUDES.** James K. Thompson. September 1951. 12p. diagrs., tab. (NACA RM L51H07)

**AN APPROACH TO THE PREDICTION OF THE FREQUENCY DISTRIBUTION OF GUST LOADS ON AIRPLANES IN NORMAL OPERATIONS.** Harry Press. April 1952. 34p. diagrs., 2 tabs. (NACA TN 2660)

**THE GUST AND GUST-LOAD EXPERIENCE OF A TWIN-ENGINE LOW-ALTITUDE TRANSPORT AIRPLANT IN OPERATION ON A NORTHERN TRANSCONTINENTAL ROUTE.** Harry Press and Robert L. McDougal. April 1952. 33p. diagrs., 8 tabs. (NACA TN 2663)

## TURBULENCE

### (6.1.2.3)

**AN INVESTIGATION OF A METHOD TO INDICATE ATMOSPHERIC TURBULENCE FROM AN AIRPLANE IN FLIGHT.** H. B. Tolefson and C. A. Gurtler. July 1951. 18p. diagrs., photo., tab. (NACA RM L50K29a)



*Turbulence - Atmospheric Gusts*  
(Cont.)

**A RELATION OF WIND SHEAR AND INSOLATION TO THE TURBULENCE ENCOUNTERED BY AN AIRPLANE IN CLEAR-AIR FLIGHT AT LOW ALTITUDES.** James K. Thompson. September 1951. 12p. diags., tab. (NACA RM L51H07)

**AUXILIARY EQUIPMENT AND TECHNIQUES FOR ADAPTING THE CONSTANT-TEMPERATURE HOT-WIRE ANEMOMETER TO SPECIFIC PROBLEMS IN AIR-FLOW MEASUREMENTS.** James C. Laurence and L. Gene Landes. December 1952. ii, 77p. diags., photos., 3 tabs. (NACA TN 2843)

**ALLEVIATION**  
(6.1.2.4)

**EXPERIMENTAL STUDY OF AN ANGLE-OF-ATTACK VANE MOUNTED AHEAD OF THE NOSE OF AN AIRPLANE FOR USE AS A SENSING DEVICE FOR AN ACCELERATION ALLEVIATOR.** Christopher C. Kraft, Jr. and Arthur Assadourian. July 1951. 8p. diags., photo. (NACA TN 2415)

**THEORETICAL STUDY OF SOME METHODS FOR INCREASING THE SMOOTHNESS OF FLIGHT THROUGH ROUGH AIR.** William H. Phillips and Christopher C. Kraft, Jr. July 1951. 96p. diags., 3 tabs. (NACA TN 2416)

## Ice Formation

## (6.2)

**ANALYSIS OF METEOROLOGICAL DATA OBTAINED DURING FLIGHT IN A SUPERCOOLED STRATIFORM CLOUD OF HIGH LIQUID-WATER CONTENT.** Porter J. Perkins and Dwight B. Kline. July 1951. 18p. diags., photos. (NACA RM E51D18)

**A SIMPLIFIED INSTRUMENT FOR RECORDING AND INDICATING FREQUENCY AND INTENSITY OF ICING CONDITIONS ENCOUNTERED IN FLIGHT.** Porter J. Perkins, Stuart McCullough and Ralph D. Lewis. July 1951. 26p. diags., photos. (NACA RM E51E16)

**AN EMPIRICAL METHOD PERMITTING RAPID DETERMINATION OF THE AREA, RATE, AND DISTRIBUTION OF WATER-DROP IMPINGEMENT ON AN AIRFOIL OF ARBITRARY SECTION AT SUBSONIC SPEEDS.** Norman R. Bergrun. September 1951. 151p. diags., 11 tabs. (NACA TN 2476)

**COMPARISON OF HEAT TRANSFER FROM AIRFOIL IN NATURAL AND SIMULATED ICING CONDITIONS.** Thomas F. Gelder and James P. Lewis. September 1951. 51p. diags., photos., 2 tabs. (NACA TN 2480)

**X-RAY DIFFRACTION STUDY OF THE INTERNAL STRUCTURE OF SUPERCOOLED WATER.** Robert G. Dorsch and Bemrose Boyd. October 1951. 14p. diags., photo. (NACA TN 2532)

**A SUMMARY OF METEOROLOGICAL CONDITIONS ASSOCIATED WITH AIRCRAFT ICING AND A PROPOSED METHOD OF SELECTING DESIGN CRITERIONS FOR ICE-PROTECTION EQUIPMENT.** Paul T. Hacker and Robert G. Dorsch. November 1951. 35p. diags. (NACA TN 2569)

**THE CALCULATED AND MEASURED PERFORMANCE CHARACTERISTICS OF A HEATED-WIRE LIQUID-WATER-CONTENT METER FOR MEASURING ICING SEVERITY.** Carr B. Neel, Jr. and Charles P. Steinmetz. January 1952. 59p. diags., photos., 6 tabs. (NACA TN 2615)

**PRELIMINARY INVESTIGATION OF CYCLIC DE-ICING OF AN AIRFOIL USING AN EXTERNAL ELECTRIC HEATER.** James P. Lewis and Dean T. Bowden. February 1952. 43p. photos., diags. (NACA RM E51J30)

**A PHOTOGRAPHIC STUDY OF FREEZING OF WATER DROPLETS FALLING FREELY IN AIR.** Robert G. Dorsch and Joseph Levine. February 1952. 29p. diags., photos., 2 tabs. (NACA RM E51L17)

**COMPARISON OF THREE MULTICYLINDER ICING METERS AND CRITIQUE OF MULTICYLINDER METHOD.** Wallace E. Howell, Mount Washington Observatory. June 1952. 40p. diags., photos., 6 tabs. (NACA TN 2708)

**A PROBABILITY ANALYSIS OF THE METEOROLOGICAL FACTORS CONDUCTIVE TO AIRCRAFT ICING IN THE UNITED STATES.** William Lewis and Norman R. Bergrun. June 1952. 93p. diags., 11 tabs. (NACA TN 2738)

**SUMMARY OF AVAILABLE HAIL LITERATURE AND THE EFFECT OF HAIL ON AIRCRAFT IN FLIGHT.** Robert K. Souther and Joseph B. Emerson. September 1952. 162p. diags., photos., 6 tabs. (NACA TN 2734)

**IMPINGEMENT OF WATER DROPLETS ON AN NACA 65<sub>1</sub>-212 AIRFOIL AT AN ANGLE OF ATTACK OF 4°.** Rinaldo J. Brun, John S. Serafini and George J. Moshos. September 1952. 47p. diags., tab. (NACA RM E52B12)

**AN INVESTIGATION UTILIZING AN ELECTRICAL ANALOGUE OF CYCLIC DE-ICING OF A HOLLOW STEEL PROPELLER WITH AN EXTERNAL BLADE SHOE.** Carr B. Neel, Jr. December 1952. 54p. diags., photos., 3 tabs. (NACA TN 2852)

**PRELIMINARY SURVEY OF ICING CONDITIONS MEASURED DURING ROUTINE TRANSCONTINENTAL AIRLINE OPERATION.** Porter J. Perkins. December 1952. 27p. diags., photos., 3 tabs. (NACA RM E52J06)

**ICING PROTECTION FOR A TURBOJET TRANSPORT AIRPLANE: HEATING REQUIREMENTS, METHODS OF PROTECTION, AND PERFORMANCE PENALTIES.** Thomas F. Gelder, James P. Lewis and Stanley L. Koutz. January 1953. 1, 57p. diags., tab. (NACA TN 2866)

**IMPINGEMENT OF CLOUD DROPLETS ON AERODYNAMIC BODIES AS AFFECTED BY COMPRESSIBILITY OF AIR FLOW AROUND THE BODY.** Rinaldo J. Brun, John S. Serafini and Helen M. Gallagher. March 1953. 20p. diags. (NACA TN 2903)

**IMPINGEMENT OF WATER DROPLETS ON A CYLINDER IN AN INCOMPRESSIBLE FLOW FIELD AND EVALUATION OF ROTATING MULTICYLINDER METHOD FOR MEASUREMENT OF DROPLET-SIZE DISTRIBUTION, VOLUME-MEDIAN DROPLET SIZE, AND LIQUID-WATER CONTENT IN CLOUDS.** Rinaldo J. Brun and Harry W. Mergler. March 1953. 71p. diags., photo., 4 tabs. (NACA TN 2904)

**AN ANALYTICAL STUDY OF HEAT REQUIREMENTS FOR ICING PROTECTION OF RANDOMES.** James P. Lewis. March 1953. 20p. diags. (NACA RM E53A22)

**A METHOD FOR DETERMINING CLOUD-DROPLET IMPINGEMENT ON SWEEPED WINGS.** Robert G. Dorsch and Rinaldo J. Brun. April 1953. 29p. diags. (NACA TN 2931)

**IMPINGEMENT OF WATER DROPLETS ON NACA 65<sub>1</sub>-208 AND 65<sub>1</sub>-212 AIRFOILS AT 4° ANGLE OF ATTACK.** Rinaldo J. Brun, Helen M. Gallagher and Dorothea E. Vogt. May 1953. 49p. diags. (NACA TN 2952)

**DE-ICING AND RUNBACK CHARACTERISTICS OF THREE CYCLIC, ELECTRIC, EXTERNAL DE-ICING BOOTS EMPLOYING CHORDWISE SHEDDING.** Robert S. Ruggeri. May 1953. 32p. photos., diags. (NACA RM E53C26)

# **OPERATING PROBLEMS**

## **(7)**

# OPERATING PROBLEMS

(7)

**SUMMARY OF INFORMATION RELATING TO GUST LOADS ON AIRPLANES.** Philip Donely. 1950. iii, 51p. diagrs., photos., 21 tabs. (NACA Rept. 997. Formerly TN 1976)

**SUMMARY OF ACCELERATION AND AIRSPEED DATA FROM COMMERCIAL TRANSPORT AIRPLANES DURING THE PERIOD FROM 1933 TO 1945.** Walter G. Walker and Roy Steiner. February 1952. 30p. diagrs., 5 tabs. (NACA TN 2625)

**STUDY OF INADVERTENT SPEED INCREASES IN TRANSPORT OPERATION.** Henry A. Pearson. March 1952. 29p. diagrs., tab. (NACA TN 2638)

**THE GUST AND GUST-LOAD EXPERIENCE OF A TWIN-ENGINE LOW-ALTITUDE TRANSPORT AIRPLANE IN OPERATION ON A NORTHERN TRANSCONTINENTAL ROUTE.** Harry Press and Robert L. McDougal. April 1952. 33p. diagrs., 8 tabs. (NACA TN 2663)

**NORMAL ACCELERATIONS AND ASSOCIATED OPERATING CONDITIONS ON FOUR TYPES OF COMMERCIAL TRANSPORT AIRPLANES FROM VGH DATA AVAILABLE AS OF SEPTEMBER 1951.** Roy Steiner and Doris A. Persh. May 1952. 8p. diagrs., 5 tabs. (NACA RM L52A28)

**AN ANALYSIS OF THE NORMAL ACCELERATIONS AND AIRSPEEDS OF A TWO-ENGINE TYPE OF TRANSPORT AIRPLANE IN COMMERCIAL OPERATIONS ON ROUTES IN THE CENTRAL UNITED STATES FROM 1948 TO 1950.** Walter G. Walker and Paul W. J. Schumacher. July 1952. 30p. diagrs., 4 tabs. (NACA TN 2735)

**AN ANALYSIS OF NORMAL ACCELERATIONS AND AIRSPEEDS OF ONE TYPE OF TWIN-ENGINE TRANSPORT AIRPLANE IN COMMERCIAL OPERATIONS OVER A NORTHERN TRANSCONTINENTAL ROUTE.** Roy Steiner. November 1952. 23p. diagrs., 4 tabs. (NACA TN 2833)

## Safety

### (7.1)

WIND-TUNNEL INVESTIGATION OF THE STABILITY OF JETTISONED NOSE SECTIONS OF THE D-558 AIRPLANE - PHASES I AND II. Stanley H. Scher. January 14, 1948. 33p. photos., diagrs., 6 tabs. (NACA RM L7K10) (Declassified from Confidential, 9/16/52)

METHOD OF ESTIMATING THE MINIMUM SIZE OF A TAIL OR WING-TIP PARACHUTE FOR EMERGENCY SPIN RECOVERY OF AN AIRPLANE. Frank S. Malvestuto, Jr. October 27, 1948. 42p. diagrs., photos., 4 tabs. (NACA RM L8D27) (Reclassified from Confidential, 7/3/51)

RELATION BETWEEN INFLAMMABLES AND IGNITION SOURCES IN AIRCRAFT ENVIRONMENTS. Wilfred E. Scull. 1951. iii, 38p. diagrs., 6 tabs. (NACA Rept. 1019. Formerly NACA TN 2227)

STUDY OF INADVERTENT SPEED INCREASES IN TRANSPORT OPERATION. Henry A. Pearson. March 1952. 29p. diagrs., tab. (NACA TN 2638)

FACILITIES AND METHODS USED IN FULL-SCALE AIRPLANE CRASH-FIRE INVESTIGATION. Dugald O. Black. March 10, 1952. 60p. diagrs., photos. (NACA RM E51L06) (Declassified from Restricted, 2/27/53)

MECHANISM OF START AND DEVELOPMENT OF AIRCRAFT CRASH FIRES. I. Irving Pinkel, G. Merritt Preston and Gerard J. Pesman. August 28, 1952. ii, 97p. diagrs., photos., 2 tabs. (NACA RM E52F06) (Declassified from Restricted, 2/27/53)

SUMMARY OF AVAILABLE HAIL LITERATURE AND THE EFFECT OF HAIL ON AIRCRAFT IN FLIGHT. Robert K. Souter and Joseph B. Emerson. September 1952. 162p. diagrs., photos., 6 tabs. (NACA TN 2734)

INVESTIGATION OF SPONTANEOUS IGNITION TEMPERATURES OF ORGANIC COMPOUNDS WITH PARTICULAR EMPHASIS ON LUBRICANTS. Charles E. Frank, Angus U. Blackham and Donald E. Swarts, University of Cincinnati. December 1952. 40p. diagrs., 6 tabs. (NACA TN 2848)

STUDY OF MOTION OF MODEL OF PERSONAL-OWNER OR LIAISON AIRPLANE THROUGH THE STALL AND INTO THE INCIPIENT SPIN BY MEANS OF A FREE-FLIGHT TESTING TECHNIQUE. Ralph W. Stone, Jr., William G. Garner and Lawrence J. Gale. April 1953. 28p. diagrs., photos., tab. (NACA TN 2923)

## PILOT-ESCAPE TECHNIQUES

### (7.1.1)

PILOT ESCAPE FROM SPINNING AIRPLANES AS DETERMINED FROM FREE-SPINNING-TUNNEL TESTS. Stanley H. Scher. October 1951. 36p. diagrs., photos., 4 tabs. (NACA TN 2485. Formerly RM L8D28)

## Navigation

### (7.2)

SUMMARY OF AVAILABLE HAIL LITERATURE AND  
THE EFFECT OF HAIL ON AIRCRAFT IN FLIGHT.  
Robert K. Souter and Joseph B. Emerson.  
September 1952. 162p. diagrs., photos., 6 tabs.  
(NACA TN 2734)

AN ANALYTICAL STUDY OF HEAT REQUIRE-  
MENTS FOR ICING PROTECTION OF RANDOMES.  
James P. Lewis. March 1953. 20p. diagrs.  
(NACA RM E53A22)

# Ice Prevention and Removal

## (7.3)

COMPARISON OF HEAT TRANSFER FROM AIRFOIL IN NATURAL AND SIMULATED ICING CONDITIONS. Thomas F. Gelder and James P. Lewis. September 1951. 51p. diags., photos., 2 tabs. (NACA TN 2480)

AN INVESTIGATION OF AIRCRAFT HEATERS. XXXVIII - DETERMINATION OF THERMAL PERFORMANCE OF RECTANGULAR- AND TRAPEZOIDAL-SHAPED INNER-SKIN PASSAGES FOR ANTI-ICING SYSTEMS. L. M. K. Boelter, V. D. Sanders and F. E. Romie, University of California. November 1951. 21p. diags., photos. (NACA TN 2524)

A SUMMARY OF METEOROLOGICAL CONDITIONS ASSOCIATED WITH AIRCRAFT ICING AND A PROPOSED METHOD OF SELECTING DESIGN CRITERIONS FOR ICE-PROTECTION EQUIPMENT. Paul T. Hacker and Robert G. Dorsch. November 1951. 35p. diags. (NACA TN 2569)

PRELIMINARY RESULTS OF CYCLICAL DE-ICING OF A GAS-HEATED AIRFOIL. V. H. Gray, D. T. Bowden and U. von Glahn. January 1952. 38p. photos., diags., tab. (NACA RM E51J29)

A PROBABILITY ANALYSIS OF THE METEOROLOGICAL FACTORS CONDUCTIVE TO AIRCRAFT ICING IN THE UNITED STATES. William Lewis and Norman R. Berggren. June 1952. 93p. diags., 11 tabs. (NACA TN 2738)

SIMPLE GRAPHICAL SOLUTION OF HEAT TRANSFER AND EVAPORATION FROM SURFACE HEATED TO PREVENT ICING. Vernon H. Gray. October 1952. 19p. diags. (NACA TN 2799)

PRELIMINARY SURVEY OF ICING CONDITIONS MEASURED DURING ROUTINE TRANSCONTINENTAL AIRLINE OPERATION. Porter J. Perkins. December 1952. 27p. diags., photos., 3 tabs. (NACA RM E52J06)

ICING PROTECTION FOR A TURBOJET TRANSPORT AIRPLANE: HEATING REQUIREMENTS, METHODS OF PROTECTION, AND PERFORMANCE PENALTIES. Thomas F. Gelder, James P. Lewis and Stanley L. Koutz. January 1953. 1, 57p. diags., tab. (NACA TN 2866)

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A METHOD FOR RAPID DETERMINATION OF THE ICING LIMIT OF A BODY IN TERMS OF THE STREAM CONDITIONS. Edmund E. Callaghan and John S. Serafini. March 1953. 33p. diags. (NACA TN 2914)

IMPINGEMENT OF WATER DROPLETS ON NACA 65<sub>1</sub>-208 AND 65<sub>1</sub>-212 AIRFOILS AT 4° ANGLE OF ATTACK. Rinaldo J. Brun, Helen M. Gallagher and Dorothea E. Vogt. May 1953. 49p. diags. (NACA TN 2952)

DE-ICING AND RUNBACK CHARACTERISTICS OF THREE CYCLIC, ELECTRIC, EXTERNAL DE-ICING BOOTS EMPLOYING CHORDWISE SHEDDING. Robert S. Ruggeri. May 1953. 32p. photos., diags. (NACA RM E53C26)

## PROPELLERS

### (7.3.2)

IMPINGEMENT OF WATER DROPLETS ON AN NACA 65<sub>1</sub>-212 AIRFOIL AT AN ANGLE OF ATTACK OF 4°. Rinaldo J. Brun, John S. Serafini and George J. Moshos. September 1952. 47p. diags., tab. (NACA RM E52B12)

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## WINGS AND TAILS

### (7.3.3)

AN EMPIRICAL METHOD PERMITTING RAPID DETERMINATION OF THE AREA, RATE, AND DISTRIBUTION OF WATER-DROP IMPINGEMENT ON AN AIRFOIL OF ARBITRARY SECTION AT SUBSONIC SPEEDS. Norman R. Berggren. September 1951. 151p. diags., 11 tabs. (NACA TN 2476)

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*Wing and Tails (Cont.)*

ANALYTICAL INVESTIGATION OF ICING LIMIT FOR DIAMOND-SHAPED AIRFOIL IN TRANSONIC AND SUPERSONIC FLOW. Edmund E. Callaghan and John S. Serafini. January 1953. 18p. diags. (NACA TN 2861)

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A METHOD FOR DETERMINING CLOUD-DROPLET IMPINGEMENT ON SWEPT WINGS. Robert G. Dorsch and Rinaldo J. Brun. April 1953. 29p. diags. (NACA TN 2931)

IMPINGEMENT OF WATER DROPLETS ON NACA 65<sub>1</sub>-208 AND 65<sub>1</sub>-212 AIRFOILS AT 4° ANGLE OF ATTACK. Rinaldo J. Brun, Helen M. Gallagher and Dorothea E. Vogt. May 1953. 49p. diags. (NACA TN 2952)

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## MISCELLANEOUS ACCESSORIES (7.3.5)

AN ANALYTICAL STUDY OF HEAT REQUIREMENTS FOR ICING PROTECTION OF RANDOMES. James P. Lewis. March 1953. 20p. diags. (NACA RM E53A22)

## PROPULSION SYSTEMS (7.3.6)

SOLUBILITY OF WATER IN HYDROCARBONS. R. R. Hibbard and R. L. Schalla. July 1952. 25p. diags., 3 tabs. (NACA RM E52D24)



## Noise

### (7.4)

SOUND FROM A TWO-BLADE PROPELLER AT SUPERSONIC TIP SPEEDS. Harvey H. Hubbard and Leslie W. Lassiter. 1952. ii, 9p. diagrs., photos. (NACA Rept. 1079. Formerly RM L51C27)

A SURVEY OF THE AIRCRAFT-NOISE PROBLEM WITH SPECIAL REFERENCE TO ITS PHYSICAL ASPECTS. Harvey H. Hubbard. May 1952. 41p. diagrs., photos. (NACA TN 2701)

EXPERIMENTS TO DETERMINE NEIGHBORHOOD REACTIONS TO LIGHT AIRPLANES WITH AND WITHOUT EXTERNAL NOISE REDUCTION. Fred S. Elwell, Aeronautical Research Foundation. May 1952. 75p. diagrs., maps, photos., 12 tabs. (NACA TN 2728)

EXPERIMENTS IN EXTERNAL NOISE REDUCTION OF A SMALL PUSHER-TYPE AMPHIBIAN AIRPLANE. John P. Roberts and Leo L. Beranek, Aeronautical Research Foundation. July 1952. 142p. diagrs., photos., 3 tabs. (NACA TN 2727)

NOISE FROM INTERMITTENT JET ENGINES AND STEADY-FLOW JET ENGINES WITH ROUGH BURNING. Leslie W. Lassiter. August 1952. 21p. diagrs. (NACA TN 2756)

EXPERIMENTAL STUDIES OF NOISE FROM SUBSONIC JETS IN STILL AIR. Leslie W. Lassiter and Harvey H. Hubbard. August 1952. 35p. diagrs., photos., tab. (NACA TN 2757)

THEORETICAL AND MEASURED ATTENUATION OF MUFFLERS AT ROOM TEMPERATURE WITHOUT FLOW, WITH COMMENTS ON ENGINE-EXHAUST MUFFLER DESIGN. Don D. Davis, Jr., George L. Stevens, Jr., Dewey Moore and George M. Stokes. February 1953. iii, 111p. diagrs., photos., 4 tabs. (NACA TN 2893)

THE ATTENUATION CHARACTERISTICS OF FOUR SPECIALLY DESIGNED MUFFLERS TESTED ON A PRACTICAL ENGINE SETUP. George M. Stokes and Don D. Davis, Jr. May 1953. 30p. diagrs., photos., tab. (NACA TN 2943)

## Heating and Ventilating (7.5)

AN INVESTIGATION OF AIRCRAFT HEATERS.  
XXXV - THERMOCOUPLE CONDUCTION ERROR  
OBSERVED IN MEASURING SURFACE TEMPER-  
ATURES. L. M. K. Boelter and R. W. Lockhart,  
University of California. July 1951. 34p. diagrs.,  
photos., tab. (NACA TN 2427)

## Piloting Techniques

### (7.7)

**FLIGHT INVESTIGATION OF SOME FACTORS AFFECTING THE CRITICAL TAIL LOADS ON LARGE AIRPLANES.** Harvey H. Brown. September 1951. 119p. diagrs., photos., 2 tabs. (NACA TN 2490)

**PILOT ESCAPE FROM SPINNING AIRPLANES AS DETERMINED FROM FREE-SPINNING-TUNNEL TESTS.** Stanley H. Scher. October 1951. 36p. diagrs., photos., 4 tabs. (NACA TN 2485. Formerly RM L8D28)

**STUDY OF INADVERTENT SPEED INCREASES IN TRANSPORT OPERATION.** Henry A. Pearson. March 1952. 29p. diagrs., tab. (NACA TN 2638)

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## Physiological (7.8)

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## Fire Hazards

### (7.9)

RELATION BETWEEN INFLAMMABLES AND  
IGNITION SOURCES IN AIRCRAFT ENVIRONMENTS.  
Wilfred E. Scull. 1951. iii, 38p. diagrs., 6 tabs.  
(NACA Rept. 1019. Formerly NACA TN 2227)

FACILITIES AND METHODS USED IN FULL-SCALE  
AIRPLANE CRASH-FIRE INVESTIGATION.  
Dugald O. Black. March 10, 1952. 60p. diagrs.,  
photos. (NACA RM E51L06) (Declassified from  
Restricted, 2/27/53)

MECHANISM OF START AND DEVELOPMENT OF  
AIRCRAFT CRASH FIRES. I. Irving Pinkel, G.  
Merritt Preston and Gerard J. Pesman. August 28,  
1952. ii, 97p. diagrs., photos., 2 tabs. (NACA  
RM E52F06) (Declassified from Restricted, 2/27/53)

INVESTIGATION OF SPONTANEOUS IGNITION  
TEMPERATURES OF ORGANIC COMPOUNDS WITH  
PARTICULAR EMPHASIS ON LUBRICANTS.  
Charles E. Frank, Angus U. Blackham and Donald  
E. Swarts, University of Cincinnati. December  
1952. 40p. diagrs., 6 tabs. (NACA TN 2848)

FREE FALL AND EVAPORATION OF n-OCTANE  
DROPLETS IN THE ATMOSPHERE AS APPLIED TO  
THE JETTISONING OF AVIATION GASOLINE AT  
ALTITUDE. Herman H. Lowell. April 1953. 25p.  
diagrs. (NACA RM E52L23a)

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**General****(7.10)**

**AN ANALYTICAL INVESTIGATION OF EFFECT OF HIGH-LIFT FLAPS ON TAKE-OFF OF LIGHT AIRPLANES.** Fred E. Weick, L. E. Flanagan, Jr., and H. H. Cherry, Agricultural and Mechanical College of Texas. September 1951. 101p. diagrs., 3 tabs. (NACA TN 2404)

**AN ANALYSIS OF AN X-RAY ABSORPTION METHOD FOR MEASUREMENT OF HIGH GAS TEMPERATURES.** Ruth N. Weltmann and Perry W. Kuhns. December 1951. 35p. diagrs., photos., 2 tabs. (NACA TN 2580)

**EXPERIMENTS TO DETERMINE NEIGHBORHOOD REACTIONS TO LIGHT AIRPLANES WITH AND WITHOUT EXTERNAL NOISE REDUCTION.** Fred S. Elwell, Aeronautical Research Foundation. May 1952. 75p. diagrs., maps, photos., 12 tabs. (NACA TN 2728)

**INVESTIGATION OF SPONTANEOUS IGNITION TEMPERATURES OF ORGANIC COMPOUNDS WITH PARTICULAR EMPHASIS ON LUBRICANTS.** Charles E. Frank, Angus U. Blackham and Donald E. Swarts, University of Cincinnati. December 1952. 40p. diagrs., 6 tabs. (NACA TN 2848)

# **INSTRUMENTS**

## **(8)**

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## (8)

**EXPERIMENTAL DETERMINATION OF TIME CONSTANTS AND NUSSELT NUMBERS FOR BARE-WIRE THERMOCOUPLES IN HIGH-VELOCITY AIR STREAMS AND ANALYTIC APPROXIMATION OF CONDUCTION AND RADIATION ERRORS.** Marvin D. Scadron and Isidore Warshawsky. January 1952. 81p. diags., 4 tabs. (NACA TN 2599)

**ELECTRICAL PRESSURE INTEGRATOR.** Arleigh P. Helfer. January 1952. 44p. photos., diags., 2 tabs. (NACA TN 2607)

**FACILITIES AND METHODS USED IN FULL-SCALE AIRPLANE CRASH-FIRE INVESTIGATION.** Dugald O. Black. March 10, 1952. 60p. diags., photos. (NACA RM E51L06) (Declassified from Restricted, 2/27/53)

**TRUE AIRSPEED MEASUREMENT BY IONIZATION-TRACER TECHNIQUE.** Bemrose Boyd, Robert G. Dorsch and George H. Brodie. July 1952. 37p. diags., photos. (NACA RM E52C31)



## Flight (8.1)

**MEASUREMENTS OF STATIC AND TOTAL PRESSURE THROUGHOUT THE TRANSONIC SPEED RANGE AS OBTAINED FROM AN AIRSPEED HEAD MOUNTED ON A FREELY FALLING BODY.** C. W. Mathews and J. R. Thompson. April 24, 1947. 5p. diags. (NACA RM L7C04a) (Reclassified from Confidential, 7/3/51)

**INVESTIGATION OF TWO PITOT-STATIC TUBES AT SUPERSONIC SPEEDS.** Lowell E. Hasel and Donald E. Coletti. November 19, 1948. 24p. diags. (NACA RM L8I02) (Declassified from Confidential, 6/4/52)

**FLIGHT CAMERA FOR PHOTOGRAPHING CLOUD DROPLETS IN NATURAL SUSPENSION IN THE ATMOSPHERE.** Stuart McCullough and Porter J. Perkins. June 1951. 23p. diags., photos. (NACA RM E50K01a)

**A SIMPLIFIED INSTRUMENT FOR RECORDING AND INDICATING FREQUENCY AND INTENSITY OF ICING CONDITIONS ENCOUNTERED IN FLIGHT.** Porter J. Perkins, Stuart McCullough and Ralph D. Lewis. July 1951. 26p. diags., photos. (NACA RM E51E16)

**EXPERIMENTAL STUDY OF AN ANGLE-OF-ATTACK VANE MOUNTED AHEAD OF THE NOSE OF AN AIRPLANE FOR USE AS A SENSING DEVICE FOR AN ACCELERATION ALLEVIATOR.** Christopher C. Kraft, Jr. and Arthur Assadourian. July 1951. 8p. diags., photo. (NACA TN 2415)

**AN INSTRUMENT EMPLOYING A CORONAL DISCHARGE FOR THE DETERMINATION OF DROPLET-SIZE DISTRIBUTION IN CLOUDS.** Rinaldo J. Brun, Joseph Levine, and Kenneth S. Kleinknecht. September 1951. 53p. diags., photos., 4 tabs. (NACA TN 2458)

**ADAPTATION OF A CASCADE IMPACTOR TO FLIGHT MEASUREMENT OF DROPLET SIZE IN CLOUDS.** Joseph Levine and Kenneth S. Kleinknecht. September 1951. 28p. diags., photos. (NACA RM E51G05)

**WIND-TUNNEL INVESTIGATION OF SIX SHIELDED TOTAL-PRESSURE TUBES AT HIGH ANGLES OF ATTACK. SUBSONIC SPEEDS.** Walter R. Russell, William Gracey, William Letko and Paul G. Fournier. November 1951. 25p. diags., tab. (NACA TN 2530)

**COMPARISON OF AIRSPEED CALIBRATIONS EVALUATED BY THE ACCELEROMETER AND RADAR METHODS.** Lindsay J. Lina and James P. Trant, Jr. January 1952. 16p. diags., photos., tab. (NACA TN 2570)

**ORIENTATION OF ORIFICES ON BODIES OF REVOLUTION FOR DETERMINATION OF STREAM STATIC PRESSURE AT SUPERSONIC SPEEDS.** Morton Cooper and Clyde V. Hamilton. January 1952. 26p. diags., photo., tab. (NACA TN 2592)

**THE CALCULATED AND MEASURED PERFORMANCE CHARACTERISTICS OF A HEATED-WIRE LIQUID-WATER-CONTENT METER FOR MEASURING ICING SEVERITY.** Carr B. Neel, Jr. and Charles P. Steinmetz. January 1952. 59p. diags., photos., 6 tabs. (NACA TN 2615)

**SUMMARY OF STALL-WARNING DEVICES.** John A. Zalovcik. May 1952. 15p. diags. (NACA TN 2676)

**ELECTRICAL TECHNIQUES FOR COMPENSATION OF THERMAL TIME LAG OF THERMOCOUPLES AND RESISTANCE THERMOMETER ELEMENTS.** Charles E. Shepard and Isidore Warshawsky. May 1952. ii, 85p. diags., photos., 9 tabs. (NACA TN 2703)

**ANALYSIS OF A PNEUMATIC PROBE FOR MEASURING EXHAUST-GAS TEMPERATURES WITH SOME PRELIMINARY EXPERIMENTAL RESULTS.** Marvin D. Scadron. May 1952. 26p. diags., 4 tabs. (NACA RM E52A11)

**INITIAL RESULTS OF INSTRUMENT-FLYING TRIALS CONDUCTED IN A SINGLE-ROTOR HELICOPTER.** Almer D. Crim, John P. Reeder and James B. Whitten. June 1952. 16p. diags., photos. (NACA TN 2721)

**INSTRUMENT-FLIGHT RESULTS OBTAINED WITH A COMBINED-SIGNAL FLIGHT INDICATOR MODIFIED FOR HELICOPTER USE.** Almer D. Crim, John P. Reeder and James B. Whitten. August 1952. 13p. diags., photos. (NACA TN 2761)

**A METHOD FOR THE DETERMINATION OF THE TIME LAG IN PRESSURE MEASURING SYSTEMS INCORPORATING CAPILLARIES.** Archibald R. Sinclair and A. Warner Robins. September 1952. 35p. diags., tab. (NACA TN 2793)

**MEASUREMENTS OF TEMPERATURE VARIATIONS IN THE ATMOSPHERE NEAR THE TROPOPAUSE WITH REFERENCE TO AIRSPEED CALIBRATION BY THE TEMPERATURE METHOD.** Lindsay J. Lina and Harry H. Ricker, Jr. October 1952. 23p. diags., tab. (NACA TN 2807)

**IMPINGEMENT OF WATER DROPLETS ON A CYLINDER IN AN INCOMPRESSIBLE FLOW FIELD AND EVALUATION OF ROTATING MULTICYLINDER METHOD FOR MEASUREMENT OF DROPLET-SIZE DISTRIBUTION, VOLUME-MEDIAN DROPLET SIZE, AND LIQUID-WATER CONTENT IN CLOUDS.** Rinaldo J. Brun and Harry W. Mergler. March 1953. 71p. diags., photo., 4 tabs. (NACA TN 2904)

## Laboratory

### (8.2)

**APPLICATION OF X-RAY ABSORPTION TO MEASUREMENT OF SMALL AIR-DENSITY GRADIENTS.** Ruth N. Weltmann, Steven Fairweather and Daryl Papke. July 1951. 41p. diags., photos. (NACA TN 2406)

**AN INVESTIGATION OF AIRCRAFT HEATERS. XXXV - THERMOCOUPLE CONDUCTION ERROR OBSERVED IN MEASURING SURFACE TEMPERATURES.** L. M. K. Boelter and R. W. Lockhart, University of California. July 1951. 34p. diags., photos., tab. (NACA TN 2427)

**POWER UNIT FOR HIGH-INTENSITY LIGHT SOURCE.** Allen E. Young, Stuart McCullough and Richard L. Smith. July 1951. 11p. diags., photo. (NACA RM E50K27)

**ON THE RECORDING OF TURBULENT LONGITUDINAL AND TRANSVERSE FLUCTUATIONS.** (Über das Messen turbulenter Längs- und Querschwankungen). H. Reichardt. August 1951. 10p. diags. (NACA TM 1313. Trans. from Zeitschrift für angewandte Mathematik und Mechanik, v. 18, no. 6, December 1938, p.358-361).

**INFLUENCE OF REFRACTION ON THE APPLICABILITY OF THE ZEHNDER-MACH INTERFEROMETER TO STUDIES OF COOLED BOUNDARY LAYERS.** Martin R. Kinsler. September 1951. 39p. diags., tab. (NACA TN 2462)

**CHARACTERISTICS OF A WEDGE WITH VARIOUS HOLDER CONFIGURATIONS FOR STATIC-PRESSURE MEASUREMENTS IN SUBSONIC GAS STREAMS.** Clarence C. Gettelman and Lloyd N. Krause. September 1951. 13p. diags. (NACA RM E51G09)

**A SPECIALLY CONSTRUCTED METALLOGRAPH FOR USE AT ELEVATED TEMPERATURES.** Joe E. Jenkins, Donald R. Buchele and Roger A. Long. September 1951. 21p. diags., photos. (NACA RM E51G12)

**A SELF-SYNCHRONIZING STROBOSCOPIC SCHLIEREN SYSTEM FOR THE STUDY OF UNSTEADY AIR FLOWS.** Leslie F. Lawrence, Stanley F. Schmidt and Floyd W. Looschen. October 1951. 30p. diags., photos., tab. (NACA TN 2509)

**EFFECTS OF PRESSURE-RAKE DESIGN PARAMETERS ON STATIC-PRESSURE MEASUREMENT FOR RAKES USED IN SUBSONIC FREE JETS.** Lloyd N. Krause. October 1951. 20p. diags. (NACA TN 2520)

**A MULTIPLE-RANGE SELF-BALANCING THERMOCOUPLE POTENTIOMETER.** I. Warshawsky and M. Estrin. November 1951. 15p. diags., photo., 2 tabs. (NACA RM E51H31)

**AN ANALYSIS OF AN X-RAY ABSORPTION METHOD FOR MEASUREMENT OF HIGH GAS TEMPERATURES.** Ruth N. Weltmann and Perry W. Kuhns. December 1951. 35p. diags., photos., 2 tabs. (NACA TN 2580)

**ELECTRICAL PRESSURE INTEGRATOR.** Arleigh P. Helfer. January 1952. 44p. photos., diags., 2 tabs. (NACA TN 2607)

**COINCIDENCE METHOD APPLIED TO ION BEAM MEASUREMENT.** Stanley Fultz and M. L. Pool. Ohio State University. February 1952. 13p. diags. (NACA TN 2627)

**A MINATURE ELECTRICAL PRESSURE GAGE UTILIZING A STRETCHED FLAT DIAPHRAGM.** John L. Patterson. April 1952. 47p. diags., photos., 2 tabs. (NACA TN 2659)

**ELECTRICAL TECHNIQUES FOR COMPENSATION OF THERMAL TIME LAG OF THERMOCOUPLES AND RESISTANCE THERMOMETER ELEMENTS.** Charles E. Shepard and Isidore Warshawsky. May 1952. ii, 85p. diags., photos., 9 tabs. (NACA TN 2703)

**ANALYSIS OF A PNEUMATIC PROBE FOR MEASURING EXHAUST-GAS TEMPERATURES WITH SOME PRELIMINARY EXPERIMENTAL RESULTS.** Marvin D. Scadron. May 1952. 26p. diags., 4 tabs. (NACA RM E52A11)

**DESIGN OF APPARATUS FOR DETERMINING HEAT TRANSFER AND FRICTIONAL PRESSURE DROP OF NITRIC ACID FLOWING THROUGH A HEATED TUBE.** Bruce A. Reese and Robert W. Graham, Purdue University. June 1952. 61p. diags., photos., tab. (NACA RM 52D03)

**USE OF A CONSOLIDATED POROUS MEDIUM FOR MEASUREMENT OF FLOW RATE AND VISCOSITY OF GASES AT ELEVATED PRESSURES AND TEMPERATURES.** Martin B. Biles and J. A. Putnam, University of California. September 1952. 51p. diags., photos., 7 tabs. (NACA TN 2783)

**A METHOD FOR THE DETERMINATION OF THE TIME LAG IN PRESSURE MEASURING SYSTEMS INCORPORATING CAPILLARIES.** Archibald R. Sinclair and A. Warner Robins. September 1952. 35p. diags., tab. (NACA TN 2793)

**INVESTIGATION OF A DIFFRACTION-GRATING INTERFEROMETER FOR USE IN AERODYNAMIC RESEARCH.** James R. Sterrett and John R. Erwin. November 1952. 36p. photos., diags. (NACA TN 2827)

**SEVERAL COMBINATION PROBES FOR SURVEYING STATIC AND TOTAL PRESSURE AND FLOW DIRECTION.** Wallace M. Schulze, George C. Ashby, Jr. and John R. Erwin. November 1952. 64p. diags., photos., tab. (NACA TN 2830)

## 192 INSTRUMENTS

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### *Laboratory (Cont.)*

**X-RAY INSTRUMENTATION FOR DENSITY MEASUREMENTS IN A SUPERSONIC FLOW FIELD.**  
John Dimeff, Ralph K. Hallett, Jr. and C. Frederick Hansen. December 1952. 39p. diags., photos., 2 tabs. (NACA TN 2845)

**A VARIABLE-FREQUENCY LIGHT SYNCHRONIZED WITH A HIGH-SPEED MOTION-PICTURE CAMERA TO PROVIDE VERY SHORT EXPOSURE TIMES.**  
Walter F. Lindsey and Joseph Burlock. May 1953. 17p. photos., diags. (NACA TN 2949)

## Meteorological

### (8.3)

**FLIGHT CAMERA FOR PHOTOGRAPHING CLOUD DROPLETS IN NATURAL SUSPENSION IN THE ATMOSPHERE.** Stuart McCullough and Porter J. Perkins. June 1951. 23p. diags., photos. (NACA RM E50K01a)

**A SIMPLIFIED INSTRUMENT FOR RECORDING AND INDICATING FREQUENCY AND INTENSITY OF ICING CONDITIONS ENCOUNTERED IN FLIGHT.** Porter J. Perkins, Stuart McCullough and Ralph D. Lewis. July 1951. 26p. diags., photos. (NACA RM E51E16)

**AN INVESTIGATION OF A METHOD TO INDICATE ATMOSPHERIC TURBULENCE FROM AN AIRPLANE IN FLIGHT.** H. B. Tolefson and C. A. Gurtler. July 1951. 18p. diags., photo., tab. (NACA RM L50K29a)

**AN INSTRUMENT EMPLOYING A CORONAL DISCHARGE FOR THE DETERMINATION OF DROPLET-SIZE DISTRIBUTION IN CLOUDS.** Rinaldo J. Brun, Joseph Levine, and Kenneth S. Kleinknecht. September 1951. 53p. diags., photos., 4 tabs. (NACA TN 2458)

**ADAPTATION OF A CASCADE IMPACTOR TO FLIGHT MEASUREMENT OF DROPLET SIZE IN CLOUDS.** Joseph Levine and Kenneth S. Kleinknecht. September 1951. 28p. diags., photos. (NACA RM E51G05)

**THE CALCULATED AND MEASURED PERFORMANCE CHARACTERISTICS OF A HEATED-WIRE LIQUID-WATER-CONTENT METER FOR MEASURING ICING SEVERITY.** Carr B. Neel, Jr. and Charles P. Steinmetz. January 1952. 59p. diags., photos., 6 tabs. (NACA TN 2615)

**COMPARISON OF THREE MULTICYLINDER ICING METERS AND CRITIQUE OF MULTICYLINDER METHOD.** Wallace E. Howell, Mount Washington Observatory. June 1952. 40p. diags., photos., 6 tabs. (NACA TN 2708)

**MEASUREMENTS OF TEMPERATURE VARIATIONS IN THE ATMOSPHERE NEAR THE TROPOPAUSE WITH REFERENCE TO AIRSPEED CALIBRATION BY THE TEMPERATURE METHOD.** Lindsay J. Lina and Harry H. Ricker, Jr. October 1952. 23p. diags., tab. (NACA TN 2807)

**IMPINGEMENT OF WATER DROPLETS ON A CYLINDER IN AN INCOMPRESSIBLE FLOW FIELD AND EVALUATION OF ROTATING MULTICYLINDER METHOD FOR MEASUREMENT OF DROPLET-SIZE DISTRIBUTION, VOLUME-MEDIAN DROPLET SIZE, AND LIQUID-WATER CONTENT IN CLOUDS.** Rinaldo J. Brun and Harry W. Mergler. March 1953. 71p. diags., photo., 4 tabs. (NACA TN 2904)

# **RESEARCH EQUIPMENT AND TECHNIQUES**

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# RESEARCH EQUIPMENT AND TECHNIQUES

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**PRELIMINARY RESULTS OF A DETERMINATION OF TEMPERATURES OF FLAMES BY MEANS OF K-BAND MICROWAVE ATTENUATION.** Leonard Rudlin. September 1951. 20p. diags. (NACA RM E51G20)

**DEVELOPMENT OF AUXILIARY CYCLOTRON EQUIPMENT FOR USING TRITIUM AS BOMBARDING PARTICLES IN A CYCLOTRON.** D. N. Kundu, F. G. Boyle and M. L. Pool, Ohio State University. December 1951. 19p. diags. (NACA TN 2573)

**COINCIDENCE METHOD APPLIED TO ION BEAM MEASUREMENT.** Stanley Fultz and M. L. Pool. Ohio State University. February 1952. 13p. diags. (NACA TN 2627)

**RADIOAUTOGRAPHIC METHOD FOR EXAMINING DISTRIBUTION OF PARTICLES IN A CYCLOTRON BEAM.** M. L. Pool and S. Fultz, Ohio State University Research Foundation. March 1952. 20p. diags., photos., 5 tabs. (NACA TN 2650)

**TRUE AIRSPEED MEASUREMENT BY IONIZATION-TRACER TECHNIQUE.** Bemrose Boyd, Robert G. Dorsch and George H. Brodie. July 1952. 37p. diags., photos. (NACA RM E52C31)

**USE OF CHOKED NOZZLE TECHNIQUE AND EXHAUST JET DIFFUSER FOR EXTENDING OPERABLE RANGE OF JET-ENGINE RESEARCH FACILITIES.** John H. Povolny. July 1952. 17p. diags. (NACA RM E52E12)

**USE OF A CONSOLIDATED POROUS MEDIUM FOR MEASUREMENT OF FLOW RATE AND VISCOSITY OF GASES AT ELEVATED PRESSURES AND TEMPERATURES.** Martin B. Biles and J. A. Putnam, University of California. September 1952. 51p. diags., photos., 7 tabs. (NACA TN 2783)

**AUXILIARY EQUIPMENT AND TECHNIQUES FOR ADAPTING THE CONSTANT-TEMPERATURE HOT-WIRE ANEMOMETER TO SPECIFIC PROBLEMS IN AIR-FLOW MEASUREMENTS.** James C. Laurence and L. Gene Landes. December 1952. ii, 77p. diags., photos., 3 tabs. (NACA TN 2843)

**A DIGITAL AUTOMATIC MULTIPLE PRESSURE RECORDER.** Bert A. Coss, D. R. Daykin, Leonard Jaffe and Elmer M. Sharp. January 1953. 24p. diags., photo. (NACA TN 2880)

## Equipment (9.1)

**EVALUATION OF THE REDUCED-MASS METHOD OF REPRESENTING WING-LIFT EFFECTS IN FREE-FALL DROP TESTS OF LANDING GEARS.** Benjamin Milwitzky and Dean C. Lindquist. July 1951. 43p. diagrs., photo., 3 tabs. (NACA TN 2400)

**A SELF-SYNCHRONIZING STROBOSCOPIC SCHLIE-REN SYSTEM FOR THE STUDY OF UNSTEADY AIR FLOWS.** Leslie F. Lawrence, Stanley F. Schmidt and Floyd W. Looschen. October 1951. 30p. diagrs., photos., tab. (NACA TN 2509)

**DIRECT MEASUREMENTS OF SKIN FRICTION.** Satish Dhawan, California Institute of Technology. January 1952. 60p. diagrs., photos. (NACA TN 2567)

**ELECTRICAL PRESSURE INTEGRATOR.** Arleigh P. Helfer. January 1952. 44p. photos., diagrs., 2 tabs. (NACA TN 2607)

**FACILITIES AND METHODS USED IN FULL-SCALE AIRPLANE CRASH-FIRE INVESTIGATION.** Dugald O. Black. March 10, 1952. 60p. diagrs., photos. (NACA RM E51L06) (Declassified from Restricted, 2/27/53)

**A MINATURE ELECTRICAL PRESSURE GAGE UTILIZING A STRETCHED FLAT DIAPHRAGM.** John L. Patterson. April 1952. 47p. diagrs., photos., 2 tabs. (NACA TN 2659)

**DESIGN OF APPARATUS FOR DETERMINING HEAT TRANSFER AND FRICTIONAL PRESSURE DROP OF NITRIC ACID FLOWING THROUGH A HEATED TUBE.** Bruce A. Reese and Robert W. Graham, Purdue University. June 1952. 61p. diagrs., photos., tab. (NACA RM 52D03)

**A METER FOR TIMING THE FLOW OF VERY SMALL VOLUMES OF A GAS.** J. C. Westmoreland, National Bureau of Standards. October 1952. 17p. diagrs., photos. (NACA RM 52I09)

**INVESTIGATION OF A DIFFRACTION-GRATING INTERFEROMETER FOR USE IN AERODYNAMIC RESEARCH.** James R. Sterrett and John R. Erwin. November 1952. 36p. photos., diagrs. (NACA TN 2827)

**SEVERAL COMBINATION PROBES FOR SURVEYING STATIC AND TOTAL PRESSURE AND FLOW DIRECTION.** Wallace M. Schulze, George C. Ashby, Jr. and John R. Erwin. November 1952. 64p. diagrs., photos., tab. (NACA TN 2830)

**DEVELOPMENT OF TURBULENCE-MEASURING EQUIPMENT.** Leslie S. G. Kovásznay. National Bureau of Standards. January 1953. 86p. diagrs., photos. (NACA TN 2839)

**AN AIRBORNE INDICATOR FOR MEASURING VERTICAL VELOCITY OF AIRPLANES AT WHEEL CONTACT.** Robert C. Dreher. February 1953. 19p. diagrs., photos. (NACA TN 2906)

**A VARIABLE-FREQUENCY LIGHT SYNCHRONIZED WITH A HIGH-SPEED MOTION-PICTURE CAMERA TO PROVIDE VERY SHORT EXPOSURE TIMES.** Walter F. Lindsey and Joseph Burlock. May 1953. 17p. photos., diagrs. (NACA TN 2949)

## WIND TUNNELS (9.1.1)

**THE LANGLEY ANNULAR TRANSONIC TUNNEL AND PRELIMINARY TESTS OF AN NACA 66-006 AIRFOIL.** Louis W. Habel. June 23, 1948. 23p. diagrs., photos. (NACA RM L8A23) (Declassified from Confidential, 7/20/51)

**INVESTIGATION OF A VARIABLE MACH NUMBER SUPERSONIC TUNNEL WITH NONINTERSECTING CHARACTERISTICS.** John C. Evvard and DeMarquis D. Wyatt. November 15, 1948. 28p. diagrs., photos., tab. (NACA RM E8J13) (Declassified from Confidential, 3/10/52)

**LINEAR THEORY OF BOUNDARY EFFECTS IN OPEN WIND TUNNELS WITH FINITE JET LENGTHS.** S. Katzoff, Clifford S. Gardner, Leo Diesendruck and Bertram J. Eisenstadt. 1950. 37p. diagrs., photo. (NACA Rept. 976. Formerly TN 1826)

**INVESTIGATION OF THE PRESSURE-RATIO REQUIREMENTS OF THE LANGLEY 11-INCH HYPERSONIC TUNNEL WITH A VARIABLE-GEOMETRY DIFFUSER.** Mitchel H. Bertram. October 6, 1950. 19p. diagrs. (NACA RM L50I13) (Declassified from Confidential, 3/10/52)

**RECTANGULAR-WIND-TUNNEL BLOCKING CORRECTIONS USING THE VELOCITY-RATIO METHOD.** Rudolph W. Hensel, Southern California Cooperative Wind Tunnel, California Institute of Technology. June 1951. 40p. diagrs. (NACA TN 2372)

**APPLICATION OF X-RAY ABSORPTION TO MEASUREMENT OF SMALL AIR-DENSITY GRADIENTS.** Ruth N. Weltmann, Steven Fairweather and Daryl Papke. July 1951. 41p. diagrs., photos. (NACA TN 2406)

**EFFECT OF FUSELAGE AND TAIL SURFACES ON LOW-SPEED YAWING CHARACTERISTICS OF A SWEEP-WING MODEL AS DETERMINED IN CURVED-FLOW TEST SECTION OF LANGLEY STABILITY TUNNEL.** John D. Bird, Byron M. Jaquet and John W. Cowan. October 1951. 19p. diagrs., photo. (NACA TN 2483. Formerly RM L8G13)

**THEORETICAL AND EXPERIMENTAL INVESTIGATION OF CONDENSATION OF AIR IN HYPERSONIC WIND TUNNELS.** H. Guyford Stever and Kenneth C. Rathbun, Massachusetts Institute of Technology. November 1951. 79p. diagrs., photos. (NACA TN 2559)

*Wind Tunnels (Cont.)*

CRITERIONS FOR CONDENSATION-FREE FLOW IN SUPERSONIC TUNNELS. Warren C. Burgess, Jr. and Ferris L. Seashore. December 1951. 39p. diags., photos., tab. (NACA TN 2518. Formerly RM E9E02)

CONSIDERATIONS ON THE EFFECT OF WIND-TUNNEL WALLS ON OSCILLATING AIR FORCES FOR TWO-DIMENSIONAL SUBSONIC COMPRESSIBLE FLOW. Harry L. Runyan and Charles E. Watkins. December 1951. 18p. diags. (NACA TN 2552)

SPECTRUM OF TURBULENCE IN A CONTRACTING STREAM. H. S. Ribner and M. Tucker. January 1952. 54p. diags., tab. (NACA TN 2606)

THE ACHIEVEMENT OF CONTINUOUS WALL CURVATURE IN DESIGN OF TWO-DIMENSIONAL SYMMETRICAL SUPERSONIC NOZZLES. J. C. Evvard and Lawrence R. Marcus. January 1952. 8p. diags. (NACA TN 2616)

A SOLUTION OF THE NAVIER-STOKES EQUATION FOR SOURCE AND SINK FLOWS OF A VISCOUS HEAT-CONDUCTING COMPRESSIBLE FLUID. Robert V. Hess. February 1952. 60p. diags., tab. (NACA TN 2630)

WIND-TUNNEL CORRECTIONS AT HIGH SUBSONIC SPEEDS PARTICULARLY FOR AN ENCLOSED CIRCULAR TUNNEL. (Windkanalkorrekturen bei hohen Unterschallgeschwindigkeiten unter besonderer Berücksichtigung des geschlossenen kreiskanals). B. Göthert. February 1952. 43p. diags., 3 tabs. (NACA TM 1300. Trans. from Zentrale für wissenschaftliches Berichtswesen der Luftfahrtforschung, Berlin. FB 1216; Deutsche Versuchsanstalt für Luftfahrt E. V., Berlin. Institut für Aerodynamik, May 16, 1940).

THREE-DIMENSIONAL SUPERSONIC NOZZLES AND INLETS OF ARBITRARY EXIT CROSS SECTION. John C. Evvard and Stephen H. Maslen. April 1952. 12p. diags. (NACA TN 2688)

CONDENSATION OF AIR IN SUPERSONIC WIND TUNNELS AND ITS EFFECTS ON FLOW ABOUT MODELS. C. Frederick Hansen and George J. Nothwang. April 1952. 49p. photos., diags. (NACA TN 2690)

A SURVEY OF THE AIRCRAFT-NOISE PROBLEM WITH SPECIAL REFERENCE TO ITS PHYSICAL ASPECTS. Harvey H. Hubbard. May 1952. 41p. diags., photos. (NACA TN 2701)

THE AERODYNAMIC DESIGN OF HIGH MACH NUMBER NOZZLES UTILIZING AXISYMMETRIC FLOW WITH APPLICATION TO A NOZZLE OF SQUARE TEST SECTION. Ivan E. Beckwith, Herbert W. Ridyand and Nancy Cromer. June 1952. 30p. diags., 5 tabs. (NACA TN 2711)

USE OF THE BOUNDARY LAYER OF A CONE TO MEASURE SUPERSONIC FLOW INCLINATION. Franklin K. Moore. June 1952. 21p. diags. (NACA TN 2723)

CHOKING OF A SUBSONIC INDUCTION TUNNEL BY THE FLOW FROM AN INDUCTION NOZZLE. W. F. Lindsey. July 1952. 20p. diags. (NACA TN 2730)

USE OF FENCES TO INCREASE UNIFORMITY OF BOUNDARY LAYER ON SIDE WALLS OF SUPERSONIC WIND TUNNELS. Rudolph C. Haefeli. July 1952. 15p. diags., photos., tab. (NACA RM E52E19)

A METHOD FOR THE DETERMINATION OF THE TIME LAG IN PRESSURE MEASURING SYSTEMS INCORPORATING CAPILLARIES. Archibald R. Sinclair and A. Warner Robins. September 1952. 35p. diags., tab. (NACA TN 2793)

X-RAY INSTRUMENTATION FOR DENSITY MEASUREMENTS IN A SUPERSONIC FLOW FIELD. John Dimeff, Ralph K. Hallett, Jr. and C. Frederick Hansen. December 1952. 39p. diags., photos., 2 tabs. (NACA TN 2845)

ESTIMATED POWER REDUCTION BY WATER INJECTION IN A NONRETURN SUPERSONIC WIND TUNNEL. Morton Cooper and John R. Sevier, Jr. January 1953. 19p. diags., tab. (NACA TN 2856)

CONVECTION OF A PATTERN OF VORTICITY THROUGH A SHOCK WAVE. H. S. Ribner. January 1953. ii, 48p. diags. (NACA TN 2864)

COMBINED EFFECT OF DAMPING SCREENS AND STREAM CONVERGENCE ON TURBULENCE. Maurice Tucker. January 1953. i, 62p. diags., tab. (NACA TN 2878)

EFFECTS OF PARALLEL-JET MIXING ON DOWNSTREAM MACH NUMBER AND STAGNATION PRESSURE WITH APPLICATION TO ENGINE TESTING IN SUPERSONIC TUNNELS. Harry Bernstein. March 1953. 26p. diags., photos. (NACA TN 2918)

THE ASYMMETRIC ADJUSTABLE SUPERSONIC NOZZLE FOR WIND-TUNNEL APPLICATION. H. Julian Allen. March 1953. 30p. diags., photos., 2 tabs. (NACA TN 2919. Formerly RM A8E17)

THE DESIGN OF VARIABLE MACH NUMBER ASYMMETRIC SUPERSONIC NOZZLES BY TWO PROCEDURES EMPLOYING INCLINED AND CURVED SONIC LINES. Clarence A. Syvertson and Raymond C. Savin. March 1953. 35p. diags., tab. (NACA TN 2922)

THE AERODYNAMIC DESIGN AND CALIBRATION OF AN ASYMMETRIC VARIABLE MACH NUMBER NOZZLE WITH A SLIDING BLOCK FOR THE MACH NUMBER RANGE 1.27 TO 2.75. Paige B. Burbank and Robert W. Byrne. April 1953. 37p. photos., diags., 5 tabs. (NACA TN 2921. Formerly RM L50L15)

THE ZERO-LIFT DRAG OF A SLENDER BODY OF REVOLUTION (NACA RM-10 RESEARCH MODEL) AS DETERMINED FROM TESTS IN SEVERAL WIND TUNNELS AND IN FLIGHT AT SUPERSONIC SPEEDS. Albert J. Evans. April 1953. 40p. diags., tab. (NACA TN 2944)

## FREE-FLIGHT (9.1.2)

INITIAL FLIGHT TESTS OF THE NACA FR-2, A HIGH-VELOCITY ROCKET-PROPELLED VEHICLE FOR TRANSONIC FLUTTER RESEARCH. J. G. Barmby and J. M. Teitelbaum. March 4, 1948. 21p. diags., photos. (NACA RM L7J20) (Declassified from Restricted, 6/11/53)



## RESEARCH EQUIPMENT AND TECHNIQUES 198 EQUIPMENT (9.1)

### *Free-Flight (Cont.)*

FLUTTER INVESTIGATION IN THE TRANSONIC RANGE OF SIX AIRFOILS ATTACHED TO THREE FREELY FALLING BODIES. S. A. Clevenson and William T. Lauten, Jr. May 6, 1948. 32p. diags., photos., 2 tabs. (NACA RM L7K17) (Declassified from Restricted, 6/11/53)

FLIGHT TEST OF NACA FR-1-B, A LOW-ACCELERATION ROCKET-PROPELLED VEHICLE FOR TRANSONIC FLUTTER RESEARCH. Ellwyn E. Angle, Sherman A. Clevenson and Reginald R. Lundstrom. July 20, 1948. 22p. diags., photos., 3 tabs. (NACA RM L8C24) (Declassified from Restricted, 6/11/53)

INVESTIGATION OF TWO PITOT-STATIC TUBES AT SUPERSONIC SPEEDS. Lowell E. Hasel and Donald E. Coletti. November 19, 1948. 24p. diags. (NACA RM L8I02) (Declassified from Confidential, 6/4/52)

WIND-TUNNEL INVESTIGATION OF SIX SHIELDED TOTAL-PRESSURE TUBES AT HIGH ANGLES OF ATTACK. SUBSONIC SPEEDS. Walter R. Russell, William Gracey, William Letko and Paul G. Fournier. November 1951. 25p. diags., tab. (NACA TN 2530)

COMPARISON OF AIRSPEED CALIBRATIONS EVALUATED BY THE ACCELEROMETER AND RADAR METHODS. Lindsay J. Lina and James P. Trant, Jr. January 1952. 16p. diags., photos., tab. (NACA TN 2570)

ORIENTATION OF ORIFICES ON BODIES OF REVOLUTION FOR DETERMINATION OF STREAM STATIC PRESSURE AT SUPERSONIC SPEEDS. Morton Cooper and Clyde V. Hamilton. January 1952. 26p. diags., photo., tab. (NACA TN 2592)

THE CALCULATED AND MEASURED PERFORMANCE CHARACTERISTICS OF A HEATED-WIRE LIQUID-WATER-CONTENT METER FOR MEASURING ICING SEVERITY. Carr B. Neel, Jr. and Charles P. Steinmetz. January 1952. 59p. diags., photos., 6 tabs. (NACA TN 2615)

A METHOD FOR THE DETERMINATION OF THE TIME LAG IN PRESSURE MEASURING SYSTEMS INCORPORATING CAPILLARIES. Archibald R. Sinclair and A. Warner Robins. September 1952. 35p. diags., tab. (NACA TN 2793)

MEASUREMENTS OF TEMPERATURE VARIATIONS IN THE ATMOSPHERE NEAR THE TROPOPAUSE WITH REFERENCE TO AIRSPEED CALIBRATION BY THE TEMPERATURE METHOD. Lindsay J. Lina and Harry H. Ricker, Jr. October 1952. 23p. diags., tab. (NACA TN 2807)

STUDY OF MOTION OF MODEL OF PERSONAL-OWNER OR LIAISON AIRPLANE THROUGH THE STALL AND INTO THE INCIPIENT SPIN BY MEANS OF A FREE-FLIGHT TESTING TECHNIQUE. Ralph W. Stone, Jr., William G. Garner and Lawrence J. Gale. April 1953. 28p. diags., photos., tab. (NACA TN 2923)

THE ZERO-LIFT DRAG OF A SLENDER BODY OF REVOLUTION (NACA RM-10 RESEARCH MODEL) AS DETERMINED FROM TESTS IN SEVERAL WIND TUNNELS AND IN FLIGHT AT SUPERSONIC SPEEDS. Albert J. Evans. April 1953. 40p. diags., tab. (NACA TN 2944)

## PROPULSION RESEARCH EQUIPMENT (9.1.4)

ESTIMATED POWER REDUCTION BY WATER INJECTION IN A NONRETURN SUPERSONIC WIND TUNNEL. Morton Cooper and John R. Sevier, Jr. January 1953. 19p. diags., tab. (NACA TN 2856)

## PROPELLER

### (9.1.5)

THE LANGLEY 2,000-HORSEPOWER PROPELLER DYNAMOMETER AND TESTS AT HIGH SPEED OF AN NACA 10-(3)(08)-03 TWO-BLADE PROPELLER. Blake W. Corson, Jr. and Julian D. Maynard. December 1952. 75p. diags., photos., 3 tabs. (NACA TN 2859. Formerly RM L7L29)

## MATERIALS

### (9.1.6)

ROTOGENERATIVE DETECTION OF CORROSION CURRENTS. Joseph B. McAndrew, William H. Colner and Howard T. Francis, Armour Research Foundation. November 1951. 12p. photos., diags. (NACA TN 2523)

AXIAL-LOAD FATIGUE PROPERTIES OF 24S-T AND 75S-T ALUMINUM ALLOY AS DETERMINED IN SEVERAL LABORATORIES. H. J. Grover and W. S. Hyler, Battelle Memorial Institute, Paul Kuhn and Charles B. Landers, Langley Aeronautical Laboratory and F. M. Howell, Aluminum Company of America. May 1953. 63p. photos., diags., 7 tabs. (NACA TN 2928)

## Technique

### (9.2)

INITIAL FLIGHT TEST OF THE NACA FR-1-A, A LOW-ACCELERATION ROCKET-PROPELLED VEHICLE FOR TRANSONIC FLUTTER RESEARCH. Ellwyn E. Angle. 25p. diagrs., photos. June 29, 1948. (NACA RM L7J08) (Declassified from Restricted, 6/11/53)

FLIGHT TEST OF NACA FR-1-B, A LOW-ACCELERATION ROCKET-PROPELLED VEHICLE FOR TRANSONIC FLUTTER RESEARCH. Ellwyn E. Angle, Sherman A. Clevenson and Reginald R. Lundstrom. July 20, 1948. 22p. diagrs., photos., 3 tabs. (NACA RM L8C24) (Declassified from Restricted, 6/11/53)

INVESTIGATION OF FRETTING BY MICROSCOPIC OBSERVATION. Douglas Godfrey. 1951. ii, 10p. photos. (NACA Rept. 1009. Formerly TN 2039)

OPTICAL METHODS INVOLVING LIGHT SCATTERING FOR MEASURING SIZE AND CONCENTRATION OF CONDENSATION PARTICLES IN SUPERCOOLED HYPERSONIC FLOW. Enoch J. Durbin. August 1951. 28p. diagrs., photos., 2 tabs. (NACA TN 2441)

STATISTICAL FLUCTUATION OF INTENSITY IN DEBYE-SCHERRER LINES DUE TO RANDOM ORIENTATION OF CRYSTAL GRAINS. Hans Ekstein, Armour Research Foundation. August 1951. 20p. diagrs., tab. (NACA TN 2447)

WIDTH OF DEBYE-SCHERRER LINES FOR FINITE SPECTRAL WIDTH OF PRIMARY BEAM. Hans Ekstein, Armour Research Foundation. September 1951. 9p. diagrs. (NACA TN 2446)

RESOLUTION OF ANNEALING EXPERIMENTS FOR THE STUDY OF NONEQUILIBRIUM STATES. Philip Schwed. September 1951. 15p. diagrs. (NACA RM E51G24)

A COMPRESSIBLE-FLOW PLOTTING DEVICE AND ITS APPLICATION TO CASCADE FLOWS. Willard R. Westphal and James C. Dunavant. April 1952. 21p. diagrs., photos. (NACA TN 2681)

EXPERIMENTAL AND THEORETICAL DETERMINATION OF THERMAL STRESSES IN A FLAT PLATE. Richard R. Heldenfels and William M. Roberts. August 1952. 35p. diagrs., photo. (NACA TN 2769)

A SPECIAL INVESTIGATION TO DEVELOP A GENERAL METHOD FOR THREE-DIMENSIONAL PHOTOELASTIC STRESS ANALYSIS. M. M. Frocht and R. Guernsey, Jr., Illinois Institute of Technology. December 1952. 59p. diagrs., photos., 3 tabs. (NACA TN 2822)

## CORRECTIONS

### (9.2.1)

COMPARISON OF TESTS OF A 4-FOOT-DIAMETER PROPELLER IN THE LANGLEY 8-FOOT AND 16-FOOT HIGH-SPEED TUNNELS. Morton Cooper. March 1946. 24p. diagrs., photo. (NACA ACR L5H31) (Declassified from Restricted, 2/28/52)

EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF SUPPORT INTERFERENCE ON THE DRAG OF BODIES OF REVOLUTION AT A MACH NUMBER OF 1.5. Edward W. Perkins. May 7, 1948. 50p. diagrs., photos. (NACA RM A8B05) (Declassified from Confidential, 4/10/53)

LINEAR THEORY OF BOUNDARY EFFECTS IN OPEN WIND TUNNELS WITH FINITE JET LENGTHS. S. Katzoff, Clifford S. Gardner, Leo Diesendruck and Bertram J. Eisenstadt. 1950. 37p. diagrs., photo. (NACA Rept. 976. Formerly TN 1826)

RECTANGULAR-WIND-TUNNEL BLOCKING CORRECTIONS USING THE VELOCITY-RATIO METHOD. Rudolph W. Hensel, Southern California Cooperative Wind Tunnel, California Institute of Technology. June 1951. 40p. diagrs. (NACA TN 2372)

AN INVESTIGATION OF AIRCRAFT HEATERS. XXXV - THERMOCOUPLE CONDUCTION ERROR OBSERVED IN MEASURING SURFACE TEMPERATURES. L. M. K. Boelter and R. W. Lockhart, University of California. July 1951. 34p. diagrs., photos., tab. (NACA TN 2427)

SOME MEASUREMENTS OF THE EFFECT OF GASEOUS IMPERFECTIONS ON THE CRITICAL PRESSURE RATIO IN AIR AND THE SPEED OF SOUND IN NITROGEN. Coleman duP. Donaldson and Jim J. Jones. August 1951. 15p. diagrs., photos., tab. (NACA TN 2437)

JET-BOUNDARY CORRECTIONS FOR COMPLETE AND SEMISPAN SWEPT WINGS IN CLOSED CIRCULAR WIND TUNNELS. James C. Sivells and Rachel M. Salmi. September 1951. 64p. diagrs., 13 tabs. (NACA TN 2454)

INVESTIGATIONS ON WINGS WITH AND WITHOUT SWEEPBACK AT HIGH SUBSONIC SPEEDS. (Untersuchungen an gefeiltten und ungefeiltten Flügeln bei hohen Unterschallgeschwindigkeiten). Jakob Ackeret, Max Degen and Nikolaus Rott. November 1951. 14p. diagrs., photos. (NACA TM 1320. Trans. from Zeitschrift für angewandte Mathematik und Physik, v.1, 1950, p.32-42).

CONSIDERATIONS ON THE EFFECT OF WIND-TUNNEL WALLS ON OSCILLATING AIR FORCES FOR TWO-DIMENSIONAL SUBSONIC COMPRESSIBLE FLOW. Harry L. Runyan and Charles E. Watkins. December 1951. 18p. diagrs. (NACA TN 2552)

RESEARCH EQUIPMENT AND TECHNIQUES  
200 TECHNIQUES (9.2)

Corrections (Cont.)

COMPARISON OF AIRSPEED CALIBRATIONS EVALUATED BY THE ACCELEROMETER AND RADAR METHODS. Lindsay J. Lina and James P. Trant, Jr. January 1952. 16p. diagrs., photos., tab. (NACA TN 2570)

EXPERIMENTAL DETERMINATION OF TIME CONSTANTS AND NUSSELT NUMBERS FOR BARE-WIRE THERMOCOUPLES IN HIGH-VELOCITY AIR STREAMS AND ANALYTIC APPROXIMATION OF CONDUCTION AND RADIATION ERRORS. Marvin D. Scadron and Isidore Warshawsky. January 1952. 81p. diagrs., 4 tabs. (NACA TN 2599)

A THEORY AND METHOD FOR APPLYING INTERFEROMETRY TO THE MEASUREMENT OF CERTAIN TWO-DIMENSIONAL GASEOUS DENSITY FIELDS. Walton L. Howes and Donald R. Buchele. April 1952. 46p. diagrs. (NACA TN 2693)

ELECTRICAL TECHNIQUES FOR COMPENSATION OF THERMAL TIME LAG OF THERMOCOUPLES AND RESISTANCE THERMOMETER ELEMENTS. Charles E. Shepard and Isidore Warshawsky. May 1952. ii, 85p. diagrs., photos., 9 tabs. (NACA TN 2703)

MEASUREMENTS OF TEMPERATURE VARIATIONS IN THE ATMOSPHERE NEAR THE TROPOPAUSE WITH REFERENCE TO AIRSPEED CALIBRATION BY THE TEMPERATURE METHOD. Lindsay J. Lina and Harry H. Ricker, Jr. October 1952. 23p. diagrs., tab. (NACA TN 2807)

SIMULATION OF LINEARIZED DYNAMICS OF GAS-TURBINE ENGINES. J. R. Ketchum and R. T. Craig. November 1952. 25p. diagrs., photo. (NACA TN 2826)

CORRECTIONS FOR DRAG, LIFT, AND MOMENT OF AN AXIALLY SYMMETRICAL BODY PLACED IN A SUPERSONIC TUNNEL HAVING A TWO-DIMENSIONAL PRESSURE GRADIENT. I. J. Kolodner, F. Reiche and H. F. Ludloff, New York University. November 1952. 45p. (NACA TN 2837)

CORRECTIONS FOR LIFT, DRAG, AND MOMENT OF AN AIRFOIL IN A SUPERSONIC TUNNEL HAVING A GIVEN STATIC PRESSURE GRADIENT. H. F. Ludloff and M. B. Friedman, New York University. December 1952. 69p. diagrs. (NACA TN 2849)

FACTORS AFFECTING LAMINAR BOUNDARY LAYER MEASUREMENTS IN A SUPERSONIC STREAM. Robert E. Blue and George M. Low. Appendix B: REDUCTION OF DATA. Jack M. Lande. February 1953. 49p. diagrs. (NACA TN 2891)

AERODYNAMICS

(9.2.2)

INITIAL TEST IN THE TRANSONIC RANGE OF FOUR FLUTTER AIRFOILS ATTACHED TO A FREELY FALLING BODY. J. G. Barmby and S. A. Clevenson. May 5, 1947. 16p. diagrs., photo., 2 tabs. (NACA RM L7B27) (Declassified from Restricted, 6/5/53)

INITIAL FLIGHT TESTS OF THE NACA FR-2, A HIGH-VELOCITY ROCKET-PROPELLED VEHICLE FOR TRANSONIC FLUTTER RESEARCH. J. G. Barmby and J. M. Teitelbaum. March 4, 1948. 21p. diagrs., photos. (NACA RM L7J20) (Declassified from Restricted, 6/11/53)

COMPARISON BETWEEN THEORY AND EXPERIMENT FOR WINGS AT SUPERSONIC SPEEDS. Walter G. Vincenti. 1951. ii, 11p. diagrs., photos. (NACA Rept. 1033. Formerly TN 2100)

APPLICATION OF X-RAY ABSORPTION TO MEASUREMENT OF SMALL AIR-DENSITY GRADIENTS. Ruth N. Weltmann, Steven Fairweather and Daryl Papke. July 1951. 41p. diagrs., photos. (NACA TN 2406)

SOME FEATURES OF ARTIFICIALLY THICKENED FULLY DEVELOPED TURBULENT BOUNDARY LAYERS WITH ZERO PRESSURE GRADIENT. P. S. Klebanoff and Z. W. Diehl, National Bureau of Standards. October 1951. 55p. diagrs., photos. (NACA TN 2475)

EFFECT OF FUSELAGE AND TAIL SURFACES ON LOW-SPEED YAWING CHARACTERISTICS OF A SWEEP-WING MODEL AS DETERMINED IN CURVED-FLOW TEST SECTION OF LANGLEY STABILITY TUNNEL. John D. Bird, Byron M. Jaquet and John W. Cowan. October 1951. 19p. diagrs., photo. (NACA TN 2483. Formerly RM L8G13)

EFFECT OF GROUND INTERFERENCE ON THE AERODYNAMIC CHARACTERISTICS OF A 42° SWEEPBACK WING. G. Chester Furlong and Thomas V. Bollech. October 1951. 24p. diagrs., photos. (NACA TN 2487. Formerly RM L8F04)

A SELF-SYNCHRONIZING STROBOSCOPIC SCHLIEREN SYSTEM FOR THE STUDY OF UNSTEADY AIR FLOWS. Leslie F. Lawrence, Stanley F. Schmidt and Floyd W. Looschen. October 1951. 30p. diagrs., photos., tab. (NACA TN 2509)

INVESTIGATIONS ON WINGS WITH AND WITHOUT SWEEPBACK AT HIGH SUBSONIC SPEEDS. (Untersuchungen an gepfeilten und ungepfeilten Flügeln bei hohen Unterschallgeschwindigkeiten). Jakob Ackeret, Max Degen and Nikolaus Rott. November 1951. 14p. diagrs., photos. (NACA TM 1320. Trans. from Zeitschrift für angewandte Mathematik und Physik, v.1, 1950, p.32-42).

*Aerodynamics (Cont.)*

AN EXPERIMENTAL INVESTIGATION OF TRANS-ONIC FLOW PAST TWO-DIMENSIONAL WEDGE AND CIRCULAR-ARC SECTIONS USING A MACH-ZEHNDER INTERFEROMETER. Arthur Earl Bryson, Jr., California Institute of Technology. November 1951. 97p. diagrs., photos. (NACA TN 2560)

DIRECT MEASUREMENTS OF SKIN FRICTION. Satish Dhawan, California Institute of Technology. January 1952. 60p. diagrs., photos. (NACA TN 2567)

EXPERIMENTAL DETERMINATION OF TIME CONSTANTS AND NUSSELT NUMBERS FOR BARE-WIRE THERMOCOUPLES IN HIGH-VELOCITY AIR STREAMS AND ANALYTIC APPROXIMATION OF CONDUCTION AND RADIATION ERRORS. Marvin D. Scadron and Isidore Warshawsky. January 1952. 81p. diagrs., 4 tabs. (NACA TN 2599)

A THEORY AND METHOD FOR APPLYING INTERFEROMETRY TO THE MEASUREMENT OF CERTAIN TWO-DIMENSIONAL GASEOUS DENSITY FIELDS. Walton L. Howes and Donald R. Buchele. April 1952. 46p. diagrs. (NACA TN 2693)

SOME EXPERIMENTS ON VISUALIZATION OF FLOW FIELDS BEHIND LOW-ASPECT-RATIO WINGS BY MEANS OF A TUFT GRID. John D. Bird and Donald R. Riley. May 1952. 32p. photos., diagrs., tab. (NACA TN 2674)

ELECTRICAL TECHNIQUES FOR COMPENSATION OF THERMAL TIME LAG OF THERMOCOUPLES AND RESISTANCE THERMOMETER ELEMENTS. Charles E. Shepard and Isidore Warshawsky. May 1952. ii, 85p. diagrs., photos., 9 tabs. (NACA TN 2703)

USE OF THE BOUNDARY LAYER OF A CONE TO MEASURE SUPERSONIC FLOW INCLINATION. Franklin K. Moore. June 1952. 21p. diagrs. (NACA TN 2723)

SOME EXPERIENCES REGARDING THE NONLINEARITY OF HOT WIRES. (Quelques expériences sur la non-linéarité des fils chauds). R. Betchov and W. Welling. June 1952. 13p. diagrs. (NACA TM 1223. Trans. from Koninklijke Nederlandsche Akademie van Wetenschappen te Amsterdam, Verhandelingen, v.53, no.4, 1950, p.432-439; Technische Hoogenschool te Delft, Laboratorium voor Aero- en Hydrodynamica. Mededeling 66).

THE EFFECT OF HIGH VISCOSITY ON THE FLOW AROUND A CYLINDER AND AROUND A SPHERE. (Der Einfluss grosser Zähigkeit bei der Strömung um den Zylinder und um die Kugel). F. Homann. June 1952. 29p. diagrs., tab. (NACA TM 1334. Trans. from Zeitschrift für angewandte Mathematik und Mechanik, v. 16, no. 3, June 1936, p. 153-164).

EXPERIMENTAL INVESTIGATION OF THE LOCAL AND AVERAGE SKIN FRICTION IN THE LAMINAR BOUNDARY LAYER ON A FLAT PLATE AT A MACH NUMBER OF 2.4. Randall C. Maydew and Constantine C. Pappas. July 1952. 22p. diagrs. (NACA TN 2740)

NONLINEAR THEORY OF A HOT-WIRE ANEMOMETER. (Théorie non-linéaire de l'anémomètre à fil chaud). R. Betchov. July 1952. 23p. diagrs. (NACA TM 1346. Trans. from Koninklijke Nederlandsche Akademie van Wetenschappen te Amsterdam, Verhandelingen, v. 52, no. 3, 1949, p. 195-207; Technische Hoogenschool te Delft, Laboratorium voor Aero- en Hydrodynamica. Mededeling 61).

EFFECT OF GEOMETRY ON SECONDARY FLOWS IN BLADE ROWS. A. G. Hansen, G. R. Costello and H. Z. Herzig. October 1952. 38p. photos. (NACA RM E52H26)

CORRECTIONS FOR DRAG, LIFT, AND MOMENT OF AN AXIALLY SYMMETRICAL BODY PLACED IN A SUPERSONIC TUNNEL HAVING A TWO-DIMENSIONAL PRESSURE GRADIENT. I. J. Kolodner, F. Reiche and H. F. Ludloff, New York University. November 1952. 45p. (NACA TN 2837)

X-RAY INSTRUMENTATION FOR DENSITY MEASUREMENTS IN A SUPERSONIC FLOW FIELD. John Dimeff, Ralph K. Hallett, Jr. and C. Frederick Hansen. December 1952. 39p. diagrs., photos., 2 tabs. (NACA TN 2845)

CORRECTIONS FOR LIFT, DRAG, AND MOMENT OF AN AIRFOIL IN A SUPERSONIC TUNNEL HAVING A GIVEN STATIC PRESSURE GRADIENT. H. F. Ludloff and M. B. Friedman, New York University. December 1952. 69p. diagrs. (NACA TN 2849)

DEVELOPMENT OF TURBULENCE-MEASURING EQUIPMENT. Leslie S. G. Kovásznay. National Bureau of Standards. January 1953. 86p. diagrs., photos. (NACA TN 2839)

FACTORS AFFECTING LAMINAR BOUNDARY LAYER MEASUREMENTS IN A SUPERSONIC STREAM. Robert E. Blue and George M. Low. Appendix B: REDUCTION OF DATA. Jack M. Lande. February 1953. 49p. diagrs. (NACA TN 2891)

EFFECT OF VARIABLE VISCOSITY AND THERMAL CONDUCTIVITY ON HIGH-SPEED SLIP FLOW BETWEEN CONCENTRIC CYLINDERS. T. C. Lin and R. E. Street, University of Washington. February 1953. 122p. diagrs. (NACA TN 2895)

SMOKE STUDIES OF SECONDARY FLOWS IN BENDS, TANDEM CASCADES, AND HIGH-TURNING CONFIGURATIONS. Arthur G. Hansen, Howard Z. Herzig and George R. Costello. March 1953. 33p. photos., diagr. (NACA RM E52L24a)

THE AERODYNAMIC DESIGN AND CALIBRATION OF AN ASYMMETRIC VARIABLE MACH NUMBER NOZZLE WITH A SLIDING BLOCK FOR THE MACH NUMBER RANGE 1.27 TO 2.75. Paige B. Burbank and Robert W. Byrne. April 1953. 37p. photos., diagrs., 5 tabs. (NACA TN 2921. Formerly RM L50L15)

STUDY OF MOTION OF MODEL OF PERSONAL-OWNER OR LIAISON AIRPLANE THROUGH THE STALL AND INTO THE INCIPIENT SPIN BY MEANS OF A FREE-FLIGHT TESTING TECHNIQUE. Ralph W. Stone, Jr., William G. Garner and Lawrence J. Gale. April 1953. 28p. diagrs., photos., tab. (NACA TN 2923)

## RESEARCH EQUIPMENT AND TECHNIQUES 202 TECHNIQUES (9.2)

### *Aerodynamics (Cont.)*

A VISUALIZATION STUDY OF SECONDARY FLOWS IN CASCADES. Arthur G. Hansen, Howard Z. Herzig and George R. Costello. May 1953. 93p. photos., diagrs. (NACA TN 2947. Formerly RM E52F19)

A VARIABLE-FREQUENCY LIGHT SYNCHRONIZED WITH A HIGH-SPEED MOTION-PICTURE CAMERA TO PROVIDE VERY SHORT EXPOSURE TIMES. Walter F. Lindsey and Joseph Burlock. May 1953. 17p. photos., diagrs. (NACA TN 2949)

A NEW SHADOWGRAPH TECHNIQUE FOR OBSERVATION OF CONICAL FLOW PHENOMENA IN SUPERSONIC FLOW AND PRELIMINARY RESULTS OBTAINED FOR A TRIANGULAR WING. Eugene S. Love and Carl E. Grigsby. May 1953. 16p. diagrs., photos. (NACA TN 2950)

## HYDRODYNAMICS

### (9.2.3)

AVERAGE SKIN-FRICTION DRAG COEFFICIENTS FROM TANK TESTS OF A PARABOLIC BODY OF REVOLUTION (NACA RM-10). Elmo J. Mottard and J. Dan Loposer. January 1953. 18p. diagrs., photos. (NACA TN 2854)

## LOADS AND CONSTRUCTION

### (9.2.4)

EVALUATION OF THE REDUCED-MASS METHOD OF REPRESENTING WING-LIFT EFFECTS IN FREE-FALL DROP TESTS OF LANDING GEARS. Benjamin Milwitzky and Dean C. Lindquist. July 1951. 43p. diagrs., photo., 3 tabs. (NACA TN 2400)

CALIBRATION OF STRAIN-GAGE INSTALLATIONS IN AIRCRAFT STRUCTURES FOR THE MEASUREMENT OF FLIGHT LOADS. T. H. Skopinski, William S. Aiken, Jr. and Wilber B. Huston. October 8, 1952. 71p. diagrs., 10 tabs. (NACA RM L52G31) (Declassified from Confidential, 6/29/53)

AN AIRBORNE INDICATOR FOR MEASURING VERTICAL VELOCITY OF AIRPLANES AT WHEEL CONTACT. Robert C. Dreher. February 1953. 19p. diagrs., photos. (NACA TN 2906)

## PROPULSION

### (9.2.5)

EXPERIMENTAL DETERMINATION OF TIME CONSTANTS AND NUSSELT NUMBERS FOR BARE-WIRE THERMOCOUPLES IN HIGH-VELOCITY AIR STREAMS AND ANALYTIC APPROXIMATION OF CONDUCTION AND RADIATION ERRORS. Marvin D. Scadron and Isidore Warshawsky. January 1952. 81p. diagrs., 4 tabs. (NACA TN 2599)

ELECTRICAL TECHNIQUES FOR COMPENSATION OF THERMAL TIME LAG OF THERMOCOUPLES AND RESISTANCE THERMOMETER ELEMENTS. Charles E. Shepard and Isidore Warshawsky. May 1952. ii, 85p. diagrs., photos., 9 tabs. (NACA TN 2703)

ANALYSIS OF A PNEUMATIC PROBE FOR MEASURING EXHAUST-GAS TEMPERATURES WITH SOME PRELIMINARY EXPERIMENTAL RESULTS. Marvin D. Scadron. May 1952. 26p. diagrs., 4 tabs. (NACA RM E52A11)

## OPERATING PROBLEMS

### (9.2.6)

AN ANALYSIS OF AN X-RAY ABSORPTION METHOD FOR MEASUREMENT OF HIGH GAS TEMPERATURES. Ruth N. Weltmann and Perry W. Kuhns. December 1951. 35p. diagrs., photos., 2 tabs. (NACA TN 2580)

FACILITIES AND METHODS USED IN FULL-SCALE AIRPLANE CRASH-FIRE INVESTIGATION. Dugald O. Black. March 10, 1952. 60p. diagrs., photos. (NACA RM E51L06) (Declassified from Restricted, 2/27/53)

A METHOD FOR THE DETERMINATION OF THE TIME LAG IN PRESSURE MEASURING SYSTEMS INCORPORATING CAPILLARIES. Archibald R. Sinclair and A. Warner Robins. September 1952. 35p. diagrs., tab. (NACA TN 2793)

EFFECTS OF PARALLEL-JET MIXING ON DOWNSTREAM MACH NUMBER AND STAGNATION PRESSURE WITH APPLICATION TO ENGINE TESTING IN SUPERSONIC TUNNELS. Harry Bernstein. March 1953. 26p. diagrs., photos. (NACA TN 2918)

## MATHEMATICS

### (9.2.7)

A THEORETICAL ANALYSIS OF THE EFFECT OF TIME LAG IN AN AUTOMATIC STABILIZATION SYSTEM ON THE LATERAL OSCILLATORY STABILITY OF AN AIRPLANE. Leonard Sternfeld and Ordway B. Gates, Jr. 1951. ii, 12p. diagrs. (NACA Rept. 1018. Formerly TN 2005)

*Mathematics (Cont.)*

SOME EFFECTS OF NONLINEAR VARIATION IN THE DIRECTIONAL-STABILITY AND DAMPING-IN-YAWING DERIVATIVES ON THE LATERAL STABILITY OF AN AIRPLANE. Leonard Sternfield. 1951. ii, 9p. diagrs., tab. (NACA Rept. 1042. Formerly TN 2233)

METHOD FOR ANALYZING INDETERMINATE STRUCTURES STRESSED ABOVE PROPORTIONAL LIMIT. F. R. Steinbacher, C. N. Gaylord and W. K. Rey, University of Alabama. June 1951. 47p. diagrs., photos., 3 tabs. (NACA TN 2376)

SUMMARY OF METHODS FOR CALCULATING DYNAMIC LATERAL STABILITY AND RESPONSE AND FOR ESTIMATING LATERAL STABILITY DERIVATIVES. John P. Campbell and Marion O. McKinney. July 1951. 97p. diagrs., 2 tabs. (NACA TN 2409)

THE STRUCTURE OF AIRY'S STRESS FUNCTION IN MULTIPLY CONNECTED REGIONS. (Struttura della funzione di Airy nei sistemi moltiplicemente connessi). Giuseppe Grioli. July 1951. 34p. (NACA TM 1290. Trans. from Giornale di Matematiche, v.77, 1947, p.119-144).

MATHEMATICAL IMPROVEMENT OF METHOD FOR COMPUTING POISSON INTEGRALS INVOLVED IN DETERMINATION OF VELOCITY DISTRIBUTION ON AIRFOILS. I. Flüge-Lotz, Stanford University. October 1951. 84p. diagrs., 3 tabs. (NACA TN 2451)

CALCULATION OF HIGHER APPROXIMATIONS FOR TWO-DIMENSIONAL COMPRESSIBLE FLOW BY A SIMPLIFIED ITERATION PROCESS. W. H. Braun and M. M. Klein. October 1951. 54p. diagrs., 10 tabs. (NACA TN 2511)

A GRAPHICAL METHOD FOR PLOTTING AMPLITUDE AND PHASE ANGLE OF TRANSFER FUNCTIONS OF DYNAMIC SYSTEMS WITHOUT FACTORING POLYNOMIALS. Earl F. Smith. November 1951. 35p. diagrs., 4 tabs. (NACA TN 2522)

A COMPARISON OF PREDICTED AND EXPERIMENTALLY DETERMINED LONGITUDINAL DYNAMIC RESPONSES OF A STABILIZED AIRPLANE. Louis H. Smaus, Marvin R. Gore and Merle G. Waugh. December 1951. 53p. diagrs., photos. (NACA TN 2578)

AUTOMATIC CONTROL SYSTEMS SATISFYING CERTAIN GENERAL CRITERIONS ON TRANSIENT BEHAVIOR. Aaron S. Boksenbom and Richard Hood. 1952. ii, 13p. diagrs. (NACA Rep. 1068. Formerly TN 2378)

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